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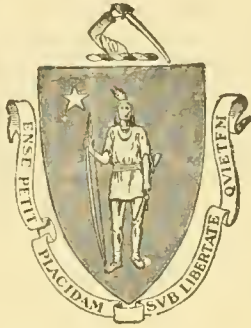
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MASSACHUSETTS

CROP REPORT.

21  
1908



Potato growing.

Sheep raising.

Drainage.

Artificial hatching and rearing of chicks

Renovating old orchards.

Strawberry growing.



MASSACHUSETTS  
CROP REPORT

FOR THE

MONTH OF MAY, 1908.

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POTATO GROWING.

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*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF  
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

*J. LEWIS ELLSWORTH, Secretary.*

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ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER  
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APPROVED BY

THE STATE BOARD OF PUBLICATION.

# CROP REPORT FOR THE MONTH OF MAY, 1908.

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OFFICE OF STATE BOARD OF AGRICULTURE,  
BOSTON, MASS., June 1, 1908.

Herewith we present the first issue of the crop report for the current year. These bulletins will be issued monthly until November 1, and will be made up in much the same way as in former years, with information as to crop and climatic conditions, both in Massachusetts and throughout the United States, reports of correspondents, and special articles on subjects which are, or should be, of interest to our farmers. The article for the present issue is on "Potato-growing Suggestions," by Dr. Chas. D. Woods, director of the Maine Agricultural Experiment Station. The potato crop is one which is sadly neglected by most of our farmers, whereas it is one of the great money crops of Maine. Dr. Woods is thoroughly posted on their methods of growing the crop, and has prepared a thorough and very instructive article, special emphasis being laid on the importance and value of spraying, and full directions being given therefor.

## PROGRESS OF THE SEASON.

The Crop Reporting Board of the Bureau of Statistics of the United States Department of Agriculture (Crop Reporter for May, 1908) finds the area of winter wheat standing on May 1 to have been about 29,751,000 acres, which is 4.2 per cent, or 1,318,000 acres, less than the area reported as sown last fall, and 5.8 per cent, or 1,619,000 acres, more than the area harvested last year. The average condition of winter wheat on May 1 was 89 per cent, as compared with 91.3 per cent on April 1, 82.9 on May 1, 1907, and 85.8, the mean of the averages of the past ten years.

The average condition of rye on May 1 was 90.3, as compared with 89.1 on April 1, 88 on May 1, 1907, and 89.5, the mean of the averages of the past ten years.

The average condition of meadow (hay) lands on May 1 was 93.5, as compared with 83.6 in 1907, and 89.5, the mean of the averages of the past ten years.

The average condition of pastures on May 1 was 92.6, as compared with 79.6 on May 1, 1907, and 87.8, the mean of the averages of the past ten years.

Of the total acreage of spring plowing contemplated, 66.6 per cent was actually done up to May 1, as compared with 71.5 last year, and 65.9, the mean of the averages of the past ten years.

Of spring planting, 54.7 was completed on May 1, as compared with 47 on May 1, 1907, and 52.6 on May 1, 1906.

In Massachusetts the average condition of winter rye was given as 93; the average condition of meadows for mowing as 95; the average condition of spring pasture as 92; the percentage of spring plowing done as 30; and the proportion of spring planting done as 18.

#### WEATHER SUMMARY, JAN. 1 TO MAY 1, 1908.

[FURNISHED BY WEATHER BUREAU, BOSTON.]

January: The weather was warmer than usual, the monthly temperature ranging from  $1^{\circ}$  to  $5^{\circ}$  higher than the average January. The daily temperatures were generally in excess until near the close of the month, zero temperature prevailing on the 30th and 31st. The monthly precipitation was somewhat below the average, and the monthly amounts were generally deficient. The snowfall was unevenly distributed through the month and over the State, the monthly amounts ranging from 2 to 12 inches. At the close of the month there was little snow on the ground.

February: The month was somewhat colder than the average, the monthly temperatures ranging from  $1^{\circ}$  to  $5^{\circ}$  below the February normal. The first decade was uniformly cold, with below zero temperatures on the 5th. During the remainder of the month there were no extremely low temperatures, except on the 25th, when zero weather was general. The precipitation was generally above the normal for the month. The snowfall ranged from 5 to 25 inches, and was

greatest in the northwestern portion of the State. The heavy snow storms were on the 1st and 6th. Generally speaking, the weather of the month was characteristic of the season.

March: The weather was warmer and more pleasant than usual, with an absence of severe storms and high winds. The temperature did not fall below zero in any portion of the section, and there were no marked extremes in either maximum or minimum temperatures. The precipitation was of frequent occurrence, but with slight exceptions the amounts were not excessive. The monthly amounts were deficient in nearly all sections. The snowfall of the month ranged from 3 to 10 inches, and at the close of the month the ground was bare.

April: The average precipitation and temperature were generally below normal, though the departures were not great in any section. The minimum temperatures occurred on the 4th and 5th, and the maximum temperatures on the 26th. The precipitation was well distributed through the month, there being few days without measurable amounts in some section of the State. The amounts were, however, generally light to moderate, very few stations having a total amount of more than 1 inch in twenty-four hours. At the close of the month the season was considered somewhat later than the average.

#### TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES NATIONAL WEEKLY WEATHER BULLETIN.]

*Week ending May 11.* — The mean temperature was slightly above normal in the extreme southern portions of Florida and Texas, and above the normal along the immediate northern border from Idaho eastward to the upper Michigan Peninsula. Elsewhere the mean temperature was below the normal, the weather being decidedly cool throughout the middle Rocky Mountain slope, central valleys, and interior portions of the Gulf and Atlantic coast districts. The minimum temperatures were below freezing in the middle Rocky Mountain and Plateau regions and along the extreme northern border eastward of the upper Missouri valley. The

rainfall ranged from 2 to 4 inches in portions of the central Gulf States, lower Missouri and central Mississippi valleys, Ohio valley, Middle Atlantic States and southern New England, and from 1 to 2 inches over a large part of the upper Missouri and Mississippi valleys, Lake region, south Atlantic States and interior of the west Gulf States. The rainfall was lighter than usual in Louisiana and Texas, throughout the southern Plateau region and Pacific coast districts, and over the greater part of the Dakotas, Minnesota, Wisconsin and upper Michigan.

*Week ending May 18.* — The mean temperature was much below the normal in the Pacific coast and Plateau regions, and slightly below from the upper Missouri valley eastward to the central portion of the upper Michigan peninsula. In the central valleys and generally throughout the Atlantic coast and east Gulf districts the mean temperature was above the normal. The mean temperature differed but slightly from the normal over a large part of central and west Gulf States and over the northern portion of the Lake region. Very heavy rains occurred in the central and west Gulf districts. In portions of the upper Missouri and upper Mississippi valleys the amounts ranged from 2 to more than 4 inches. The precipitation was light in the Atlantic coast districts and generally throughout the Ohio valley, ranging for the most part from inappreciable amounts to  $\frac{3}{4}$  inch. On the Pacific coast the weekly precipitation ranged from  $\frac{1}{4}$  to more than  $\frac{3}{4}$  inch in northern California, and generally from 1 to 3 inches in Oregon and Washington.

*Week ending May 25.* — The mean temperature was above the normal in the Lake region, central valleys and Atlantic coast and Gulf districts. The excess ranged from  $3^{\circ}$  to  $7^{\circ}$  a day, amounting to more than  $6^{\circ}$  per day in portions of the upper Lake region, lower Mississippi valley, lower Lake region, southern New England and northern portion of the Middle Atlantic States. The mean temperature was below the normal in the Rocky Mountain and Plateau regions and on the north Pacific coast, averaging decidedly cool in the middle and northern portions of the districts. The precipitation was very heavy over the greater part of Texas and



Oklahoma, ranging from 2 to more than 8 inches. It was also very heavy in Iowa and Minnesota, on the Atlantic coast from the Carolinas northward to southern New England, and over a large part of the northern Rocky Mountain region. The precipitation was light in the central and east Gulf States, upper Ohio valley and a large part of the Lake region and northern New England, and over a small area on the east Gulf coast.

*Week ending June 1.* — The mean temperature was below the normal in the northern portion of the upper Mississippi valley, the Red River of the North and upper Missouri valleys, throughout the Rocky Mountain, Plateau and Pacific coast regions, the deficiency amounting to more than  $3^{\circ}$  a day. The mean temperature was above the normal in the west Gulf States, Oklahoma, Arkansas and Missouri, and in all districts eastward of the Mississippi River, with the exception of eastern Maine and southern Florida. The daily excess ranged from  $3^{\circ}$  to  $9^{\circ}$ , and was most marked in the Middle Atlantic States and New England. Heavy rains occurred in the northern Rocky Mountain region, the lower Missouri and upper Mississippi valleys, upper Lake region, New England, along the middle and south Atlantic coasts and over local areas in the Gulf States, the amounts ranging from 2 to 4 inches. Elsewhere throughout the country the precipitation for the week was light.

### SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

*Week ending May 11.* — New England. Boston: The weather was cloudy and cold until the 11th, when it became much warmer, the maximum temperature being near  $80^{\circ}$  in the central-southern portions. Freezing temperatures occurred on the 5th in the interior of Maine, New Hampshire, western Massachusetts and Vermont. Heavy rains were general on the 7th and 8th over the greater part of Massachusetts, Rhode Island and Connecticut, the amount for the week being near or somewhat more than 2 inches. The mean temperature was below the normal, and the precipitation

generally much above. Warmer weather and sunshine are needed.

*Week ending May 18.* — New England. Boston: The mean temperature was above the normal, the excess ranging from  $3^{\circ}$  to  $5^{\circ}$ . The minimum on the 15th was near freezing in the interior of Maine, New Hampshire, Vermont and parts of Massachusetts. The precipitation was light and beneficial, the ground being wet from the rains of previous weeks. The sunshine was above the average.

*Week ending May 25.* — New England. Boston: The weather was cloudy and showery from the 20th to the 23d. The beginning and the end of the week were clear. Heavy showers occurred on the 23d in Rhode Island, Connecticut and southwestern Massachusetts. The rainfall was deficient in Maine, Vermont, northern New Hampshire and eastern Massachusetts, where the total for the week was between .1 and .3 inch. Excessive rains occurred in Rhode Island, Connecticut and southwestern Massachusetts, where between 1 and 2 inches fell. The mean temperature was somewhat above the normal, and the sunshine somewhat below.

*Week ending June 1.* — New England. Boston: The weather conditions were generally favorable. The mean temperature was above the normal, the nights being warm. The maximum temperatures were generally near or above  $80^{\circ}$  during the beginning and end of the week. There was but little rain until the 30th, when copious showers fell throughout the section, except in Plymouth County, Mass. The total precipitation was near the normal in the interior of Maine and in central Vermont and northern New Hampshire, and much above the normal in the remainder of the district, except in eastern Massachusetts. The sunshine was somewhat below the normal.

#### THE WEATHER OF MAY, 1908.

The opening week of the month was generally cloudy, with frequent light to moderate rains and low and unseasonable temperatures. In some sections frosts were reported in the early days of the week. By the 10th the weather became

warmer and generally seasonable, with sunshine near the average, and with slight exceptions the conditions continued through the remainder of the month. General moderate to heavy showers occurred on the 23d, especially in parts of Berkshire, Hampden, Hampshire and Worcester counties. Scattered local showers occurred on several other days, but were irregularly distributed. The precipitation for the month as a whole, over the entire State, was considerably below the average for the month of May. At the close of the month the season was very near the average.

In the circular to correspondents, returnable May 25, the following questions were asked: —

1. How does the present season compare, agriculturally speaking, with a normal season?

2. What is the promise for pastures and mowings, and did fall seeding winter well?

3. How did the bloom of apples, pears, peaches, plums and small fruits compare with the bloom of former years, and has it suffered from frosts?

4. What insects are doing the most damage in your locality?

5. How is planting progressing?

6. Is farm help scarce, or plenty, and what proportion can be called good help?

7. What are the average wages paid farm help in your vicinity, with board? Without board?

8. Will there be any marked change in the acreage of the usual farm crops, particularly corn and potatoes, and do you note any new enterprises in the line of agriculture?

Returns were received from 151 correspondents, and from them the following summary has been compiled: —

#### THE SEASON.

April was a cold and unpleasant month, and May opened behind the average of other years. The same conditions continued during the first days of the month, and planting and farm work of all kinds did not progress rapidly, while vege-

tation made little progress. The rains and warm weather which followed had a very beneficial effect on vegetation, and the fruit bloom occurred very nearly at the average time. The rainfall was not heavy in most sections, but was well distributed, and came at such intervals as to do the maximum amount of good. There were practically no frosts during the month. The month closed fully up to the average, both as to work and vegetation, and with every prospect of excellent results, if a good start is of any efficacy in securing the same.

### PASTURES AND MOWINGS.

Feed in pastures was short with the coming of cold weather last year, and with the cold spring was slow in starting. However, it had begun to be in good condition at the time of making returns, and promised excellently for the future. Grass in mowings was generally in excellent condition, the frequent rains and cool weather of early spring giving it an excellent foundation, while the warm weather of the latter part of the month stimulated the growth. For some reason, probably the open winter, there is a good deal of winter-killing of grass, particularly fall-seeded grass. Fall seeding did not get a very good start in the fall of 1907, and came through the winter in poorer shape than did grass on old seeded fields.

### FRUIT BLOOM.

The fruit bloom is generally reported as being extremely heavy for all kinds of fruit. Peaches are the only exception, and with this fruit the bloom seems to be above the average, taking the State as a whole. Small fruits were not generally in bloom at the time of making returns, but so far as reported on they also bloomed heavily. This being the bearing year for apples, a good crop should be secured. Blackberries and raspberries appear to have wintered well. Strawberries promised well, so far as reported on. There were no frosts to do damage from the time of blooming to the close of the month, and all danger from that source appears to be safely past.



## INSECTS.

As usual at this early season of the year, there is very little damage reported from insects. Tent caterpillars are the insect most commonly reported as present, but cannot be said to be numerous, as only 43 correspondents report them. Other insects mentioned are gypsy and brown-tail moth caterpillars, currant worms, cut worms, elm leaf beetles, black flies, squash bugs, asparagus beetles, canker worms, potato beetles and the San José scale. Doubtless there will be the usual reports of injury later in the season. Several correspondents report that the gypsy moth appears to be gaining ground.

## PLANTING.

Planting progressed slowly, owing to the cold weather and rains of the early part of the month, but with the coming of warm weather the work was rushed, and was at its height at the time of making returns. Potatoes were generally planted at that time, and corn planting was begun. Onions were up in good shape, and tobacco setting had begun. Probably planting was practically completed by the close of the month in all sections.

## FARM HELP AND WAGES.

Farm help was considerably easier to secure than for several years past, owing to the shutting down of various mills and factories. Most of the additional supply was inexperienced, but even inexperienced help was very difficult to secure in former years. There seems to be the usual supply of good help, with the proportion to that classed as poor help relatively small. Wages are not quite as high as in former years: \$20 per month with board seems to be a fair average, and \$30 per month without board, but with tenement, milk and fuel. Help hired under other conditions is almost all hired by the week or the day. The minimum wage for day labor is apparently \$1.50 per day, with higher wages paid in many instances. There seems to be less difficulty in securing day help than for several years past.



## ACREAGE OF FARM CROPS.

The acreage of cultivated crops, particularly corn and potatoes, will be considerably increased. This is due partly to the easier conditions in regard to securing help, and partly to the high prices which have prevailed for grain during the winter. Many farmers have been led by these prices to look into the question of raising more grain for their cattle, and this would alone account for the general increase in the acreage of corn. The increase of acreage of potatoes is not so easily accounted for, but it seems likely that more help is being hired, and that this crop is being raised as a money crop in many cases, rather than simply for home use. The acreage of tobacco seems to have suffered a slight decrease, because of poor sale of last year's crop; and this decrease in tobacco acreage is balanced by an increase in that devoted to onions.

## NOTES OF CORRESPONDENTS.

(Returned to us May 25.)

## BERKSHIRE COUNTY.

*New Marlborough* (E. W. RHOADES). — The season is about a normal one at this date. Meadows and pastures came through the winter well, also fall seeding. Fruit trees blossomed well, with the exception of Baldwin apples; strawberries promise a full crop. No damage from insects as yet. There is a large acreage of potatoes already planted, and corn and gardens are well under way. Farm help is plenty, at old prices. Wages average from \$20 to \$30 per month with board and \$1.50 per day without board. I think that farmers realize the necessity of raising more grain.

*Monterey* (WM. S. BIDWELL). — The season promises well. Pastures and mowings are in good condition, but fall seeding winter-killed badly. There was a wonderful fruit bloom, and no damage from frost. Tent caterpillars are doing some damage. Planting is progressing finely. Farm help is scarce, and there is almost no good help. Wages average \$25 per month with board and \$1.75 per day without board. There are no marked changes in the acreage of farm crops.

*Tyringham* (EDWARD H. SLATER). — The present season compares favorably with a normal season. Pastures and mowings are looking finely; very little fall seeding has been done in this locality. Apple orchards are in full bloom, and have not suffered from frosts. Planting is rather behind the usual development at this season. Farm help is more plenty than usual, and about half of it can be called good help. Wages average \$20 per month with board and \$1.50 per day without board.

*West Stockbridge* (J. S. MOORE). — The season is at least ten days earlier than last year. Pastures and mowings are looking finely, while fall seeding is fairly good. Fruit trees are now in full bloom, and the bloom is well up to the average; no frost as yet. No insects have appeared as yet. Planting is progressing well, but is somewhat interrupted by frequent showers. There is but little or no good farm help to be had. Wages range from \$20 to \$30 per month with board and \$1.25 to \$1.50 per day without board. About the usual crops are being put in. Our farmers are entering into the milk business more than formerly, notwithstanding the exacting conditions of the contractors.

*Richmond* (TIMOTHY B. SALMON). — The present season is up to the average. Pastures are short, but mowings are good; there is no fall seeding. There is more than an average fruit bloom, with no damage by frosts. I have not seen any damage by insects. Planting is up to the average. Farm help is scarce, and 25 per cent of it is good help. Wages average from \$24 to \$26 per month with board and \$36 to \$42 per month without board. There are no marked changes in the acreage of farm crops.

*Washington* (E. H. EAMES). — The season is earlier than last year. Pastures are late, also mowings; fall seeding wintered well. Apples and pears have made full blooms. There are no insects at present. Planting is backward for the time of year, owing to rain. Farm help is not to be found at any price. Wages average \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

*Hancock* (B. H. GOODRICH). — The season is later than the normal. Pastures and mowings are in average condition. Apples and what small fruits we have show a heavy bloom, with no damage as yet from frosts. Tent caterpillars are doing a little damage. Planting is progressing slowly, and practically no corn has been planted as yet. Farm help is scarce. Wages average \$25 or \$26 per month with board and \$1.50 per day without board. There will be no marked changes in the acreage of the usual farm crops.

*Cheshire* (L. J. NORTHUP). — The present outlook compares very favorably with a normal season. Pastures and mowings promise extra well, and fall seeding is in good condition. The bloom of apples, plums and small fruits is very full. Insects are not doing any damage in this locality. Planting is rather backward, owing to the rainy and wet condition of the ground. Farm help is very scarce, and not much of it is good help. Wages average \$25 per month with board and from \$35 to \$40 per month without board. There will be no marked difference from former years in the acreage of the leading crops.

*Williamstown* (S. A. HICKOX). — The season is fully up to the normal. Pastures are in fine condition, with a good outlook for mowings. All kinds of fruit bloomed full. There are no insects doing damage here. Planting is progressing well, and the ground is in fine condition. Farm help is plenty. Wages average from \$20 to \$25 per month with board and from \$35 to \$40 per month without board. There will be no marked changes in the acreage of the usual farm crops.

## FRANKLIN COUNTY.

*Rowe* (N. E. ADAMS). — The season has been a very good one up to the present time. Mowings are looking better than I ever saw them at this time of year. Pastures are in very good condition, also fall seeding. Fruit trees are not yet fully in bloom. No insects have appeared as yet. Planting is a week further advanced than usual. Farm help is plenty and good. Wages range from \$20 to \$25 per

month with board and average \$1.50 per day without board. There is no marked change in the acreage of the usual farm crops. There has been plenty of rain and not very cold nights.

*Charlemont* (J. M. J. LEGATE). — The season is earlier than usual, with a great deal more than the average rainfall. Pastures and mowings are in splendid shape, and fall seeding wintered well. There is an average bloom of all fruits except peaches, and no damage from frosts. No insects are doing damage as yet. Very little planting has been done, as the ground has been too wet, rain storms following one another before the ground dried out. Farm help is scarce, but mostly good. Wages average from \$20 to \$25 per month with board and \$30 per month without board. There will perhaps be a slight increase in the acreage of potatoes.

*Leyden* (FRANK R. FOSTER). — The season promises well. The outlook for mowings is good at present, and fall seeding wintered fairly well. The fruit bloom is fully up to the average, and there have been no frosts. Planting is progressing slowly. Farm help is plenty, and there is more good help than in former years. Wages average from \$20 to \$25 per month with board and \$1.50 to \$1.75 per day without board. Possibly there will be an increase in the acreage of potatoes.

*Deerfield* (DWIGHT A. HAWKES). — The season is a normal one. Pastures and mowings are in good condition, and fall seeding wintered well. All fruit trees bloomed well, and there has been no damage from frost. No insects are doing damage as yet. Planting is progressing very well. Farm help is plenty, and three-quarters of it is good help. Wages average about \$21 per month with board and \$1.50 per day without board. There is a small increase in the acreage of potatoes.

*Whately* (C. L. CRAFTS). — The season is a normal one. Pastures and mowings are in excellent condition, and fall seeding wintered well. Fruits of all kinds blossomed well, and we have had no frosts. Orchards are more or less affected by different insects. Farmers are well along with their planting. Farm help is very plenty, but not over one-third of it is good help. Wages range from \$18 to \$25 per month with board and \$35 to \$42 per month without board. The acreage of corn will be about as usual, but that of potatoes will be increased. The acreage of onions will be much increased, many raising onions instead of tobacco.

*Montague* (A. M. LYMAN). — The present season is nearly up to the normal. Pastures and mowings promise excellently, and fall seeding wintered well. The fruit bloom is the best in several years. A few tent caterpillars are the only insects doing damage. Planting is well along. Farm help is quite plenty, and more of it good help than usual. Wages average \$23 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of the usual farm crops.



*Wendell* (NELSON D. PLUMB). — The season is very backward, and but little planting has been done as yet. Grass is coming on fast, and fall seeding looks finely. Fruit of all kinds is in full bloom, and has not suffered from frosts. No insects are doing damage as yet. Early potatoes are the only crop planted at present. There is plenty of help of all kinds, about one-half of it good. Wages average from \$25 to \$30 per month with board and \$45 per month without board. There will probably be an increased acreage of corn.

*Orange* (A. C. WHITE). — The season is fully up to the average. The dry fall last year left the pastures short, but the rains and sunshine are bringing it up all right. All fruit has bloomed full. The tent caterpillar is the only insect doing any damage at present. If the weather holds good this week, planting will be completed. The principal change in the acreage of farm crops will be that more corn will be raised for grain than usual.

*New Salem* (DANIEL BALLARD). — The season is fully up to the normal. Pastures and mowings are very promising, and fall seeding wintered well. There is a heavy fruit bloom, and no damage from frosts. Tent caterpillars are quite plenty. Planting is progressing rather slowly, on account of the wet weather. Farm help is rather scarce, especially good help. Wages average from \$1.75 to \$2 per day without board. There will be about the usual acreage of farm crops.

## HAMPSHIRE COUNTY.

*Ware* (J. H. FLETCHER). — The season is two weeks in advance of last year. Pastures are looking well, and mowings which are well cared for are better than last year at this time. The fruit bloom is far in advance of last year, with no frosts to date. Insects are not doing any damage as yet. Planting is progressing very well. There is more help to be had than last year, but good help is hard to find. Wages average from \$20 to \$25 per month with board and about \$1.50 per day without board. There will perhaps be an increase in the acreage devoted to corn.

*Greenwich*, (WALTER H. GLAZIER). — The season is a good average one. Pastures and mowings are in excellent condition; fall seeding wintered well. Apples bloomed well; no damage from frosts. No insects have appeared as yet. Planting is rather backward, on account of cold and wet weather. Farm help is about as for some years as regards supply. Wages range from \$1.50 to \$1.75 per day without board; no help hired by the month. There is about the usual acreage of corn and potatoes.

*Prescott* (W. F. WENDERMUTH). — The season is perhaps a few days late. Pastures and mowings promise well, and fall seeding wintered well. There was a full bloom on fruit trees, and no frost of consequence. No insects, except tent caterpillars, are doing damage. Planting is progressing fairly well; potatoes mostly all in, and corn



ground in preparation. Farm help is scarce, and mostly poor. Wages average from \$22 to \$25 per month with board and \$1.50 to \$1.75 per day without board. There is about the usual acreage of farm crops.

*Amherst* (WM. P. BROOKS). — The season is practically normal, from five to seven days earlier than last year. Mowings and pastures are especially promising; fall seeding wintered well. The fruit bloom is above the average, except Baldwin apples; no frost injury. No insects are especially prominent. Planting is about at the usual point for the time of year, with considerable corn planted; recent rains have delayed work on low lands. Farm help is plenty, and of fair quality. Wages range from \$18 to \$25 per month with board and average \$1.50 per day without board. More potatoes and onions have been planted than usual, because of poor sale of tobacco last year. There is a very large orchard, 30 to 40 acres, being set in South Amherst; apples, interspersed with peaches, plums, cherries and some dwarfs.

*Hadley* (H. C. RUSSELL). — The season is about an average one. Pastures and mowings are in good condition. The bloom of apples and pears is about normal; not much bloom on peaches. There are no insects doing damage. Planting of corn and potatoes is later than usual. Farm help is more plenty than usual, and half of it is good help. Wages average from \$18 to \$22 per month with board and \$30 to \$33 per month without board. There is not much change in the acreage of any of our cultivated crops.

*Easthampton* (WM. C. CLAPP). — The season compares favorably with the normal. Pastures and mowings are looking well, and fall seeding wintered well. The fruit bloom was full, with no damage from frosts. Currant worms and cut worms are doing some damage. Rains have hindered planting somewhat, but the acreage of cultivated crops is increased. There is plenty of farm help, and three-quarters of it is good help. Wages average from \$20 to \$25 per month with board and \$1.25 to \$1.50 per day without board. The acreage of tobacco will not be any larger than formerly.

*Southampton* (C. B. LYMAN). — The season has been cold and wet, but is not far from the normal. Pastures come forward slowly, but mowings are very forward and fall seeding wintered well. There is a good bloom of apples; pears very full; peaches light; strawberries very fine; and there has been no injury from frost. There are very few insects doing damage. A good deal of planting remains to be done, owing to the land being wet. Most farmers have help, and about half is good. Wages average from \$15 to \$20 per month with board and \$1.50 per day without board. There will be about the usual acreage of farm crops.

*Chesterfield* (HORATIO BISBEE). — The season has opened well, though excess of rain has held planting back. Pastures are good; mowings winter-killed to some extent; but little fall seeding done. There has been a full bloom on all fruit trees except Baldwin apples,

and no damage from frosts. No insects have appeared as yet. There is plenty of help, but it is not what it should be. Wages average from \$18 to \$20 per month with board and \$1.50 per day without board. But little planting has been done. There will be an increased acreage of corn and potatoes, and the increase would be greater except for the high price of help.

*Goshen* (ALVAN BARRUS). — The season is at least two weeks later than the normal. According to the old adage of a cold, wet May, there should be a good hay crop, but ice beds have left many winter-killed sections. The fruit bloom is at its height, and unusually full for all fruits. No insects have appeared as yet. Very little planting has been done, most lands being still too cold and wet. There is more help at hand than usual, and about half of it is good help. Wages are from \$1.50 to \$2 per day without board; none to be had by the month. There will be little change from the usual acreage of farm crops.

#### HAMPDEN COUNTY.

*Blandford* (ENOS W. BOISE). — The season is about a normal one. Grass on all meadows is looking extra good, as are also pastures; no complaint of grass winter-killing. All fruits will give an extra yield, if bloom promises anything. Tent caterpillars are the only insects doing damage. Land has been so wet and cold that planting has been delayed, but is now being rushed. Farm help is more plenty than for several years, and about half of it is good help. Wages are about 10 per cent less than last season. The usual amount and kinds of crops will be raised.

*Russell* (E. D. PARKS). — The season is fully up to the average, but is rather wet. Pastures and mowings are in very good condition, and fall seeding wintered well. There is a very good fruit bloom, with no damage from frost. Planting is rather backward, on account of wet weather. There is plenty of help, but not much good help. Wages average \$20 per month with board and \$1.50 per day without board. There will be no marked changes in the acreage of farm crops.

*Southwick* (L. A. FOWLER). — The season compares very favorably with the normal. The promise for pastures and mowings is very good, and fall seeding wintered well. The fruit bloom was very abundant, with no damage from frost. Planting is progressing about as usual. Farm help is plenty, with but a small percentage of it good help. Wages range from \$12 to \$20 per month with board and \$1.50 to \$1.75 per day without board. More corn and potatoes have been put in than usual. The acreage of tobacco will be less this year than usual, and setting will be well commenced this week.

*Agawam* (J. G. BURT). — The season is better than a year ago at this time. Pastures and mowings are looking well, and fall seeding wintered well. The fruit bloom is better than in former years, with

no damage from frosts. Tent caterpillars are the only insects doing damage, and they are very few. Planting is progressing slowly, the ground being pretty wet just now. There is plenty of help, but it is not good help. Wages average from \$20 to \$22 per month with board and \$30 to \$35 per month without board. There will be an increased acreage of corn and potatoes.

*West Springfield* (T. A. ROGERS). — The season is fully up to the normal, and about two weeks ahead of last year. Pastures and mowings look well, and fall seeding wintered well. There is a full average bloom of all fruits, with no damage from frosts. There are a few tent caterpillars and currant worms doing damage. Planting is well up to the average of former years. Help is plenty, and generally good. Wages average from \$20 to \$25 per month with board and \$1.25 to \$1.50 per day without board. There will be some increase in the acreage of both corn and potatoes.

*East Longmeadow* (JOHN L. DAVIS). — The season is a little late, but the outlook is better than the normal. Pastures and mowings are looking well, and fall seeding wintered well. There was a good fruit bloom, and no damage from frosts. It is too early for insects to be making trouble. Crops are being planted rapidly now. Farm help is plenty, but not over one-third is good help. Wages average \$20 per month with board and \$1.50 per day of nine hours with dinner. There will be an increased acreage of potatoes this year.

*Monson* (F. D. ROGERS). — The season is fully up to the average. Pastures and mowings are in good condition, and fall seeding wintered well. The peach bloom is 50 per cent of the normal; other fruits full. There is no serious damage from any insect. Planting is well advanced. Help is plenty, but only a small percentage of it can be called good help. Wages average \$20 per month with board and \$1.50 per day without board. There will be an increased acreage of corn.

*Palmer* (O. P. ALLEN). — The season compares most favorably with the normal. Pastures and mowings promise well. Only a part of the fruit trees came into bloom, but they were very full. But few insects have appeared as yet. Planting is progressing as well as usual at this season of the year. Farm help is scarce, and but a small part of it good help. Wages average \$18 per month with board and \$1.50 per day without board. No marked changes are being made in the acreage of the usual farm crops.

*Holland* (FRANCIS WIGHT). — The season is fully up to the normal. Pastures and mowings are looking well. The bloom of apples, pears, plums and small fruits is more than an average one. Insects have not done much damage as yet. Not much corn has been planted as yet, but potatoes are mostly put in. Good farm help is scarce. Wages average \$1 per day with board and \$1.50 per day without board. There is no marked change in the acreage of the usual farm crops.



## WORCESTER COUNTY.

*Dudley* (J. J. GILLES). — The season is, generally speaking, a normal one. The promise for pastures and mowings is very favorable. Large fruits bloomed full; small fruits suffered from frosts, in some cases severely. No insects are doing damage as yet. Planting is progressing fairly well. There is the usual supply of good and experienced help, and inexperienced help is plenty enough. Wages average \$20 per month with board and from \$1.50 to \$1.75 per day without board. There will be no marked changes in the acreage of the usual farm crops.

*West Brookfield* (MYRON A. RICHARDSON). — The season is earlier than for several years. Pastures and mowings are looking finely, and fall seeding wintered well. Apple bloom not quite as full as two years ago; other fruits about normal. No insects are doing damage at present. Potatoes are nearly all planted, and considerable corn. Farm help is more plenty than last year, with 25 per cent of it good help. Wages range from \$22 to \$28 per month with board and \$35 to \$45 per month without board. There are more potatoes planted this year than last, and a good deal of small fruit set out.

*North Brookfield* (JOHN H. LANE). — Vegetation is very forward this season. Pastures are in poor condition, but mowings look finely. Bloom of apples and pears full, peaches and plums light. There are very few insects doing damage. Planting is very backward, owing to cold weather. Farm help is more plenty than usual, and more of it good help. Wages range from \$15 to \$20 per month with board and \$1.50 to \$1.75 per day without board. Less corn than usual has been planted, owing to cold weather.

*Oakham* (JESSE ALLEN). — The season compares favorably with the normal. Pastures and mowings look well, and fall seeding wintered well. There is quite a full fruit bloom, with no damage from frost. There are a few tent caterpillars doing damage. Planting is nearly completed. Farm help is plenty, and half of it good help. Wages average from \$20 to \$25 per month with board and \$30 to \$40 per month without board. There will be no marked change in the acreage of the usual farm crops.

*Petersham* (B. W. SPOONER). — The season is a promising one agriculturally. Pastures and mowings look well, and fall seeding fair. All fruits blossomed full and look finely, with no damage from frosts. No insects have appeared as yet. Potatoes are all planted, and corn planting is going on. Help is more plenty than last year, and about half of it good help. Wages average \$20 per month with board and \$1.50 per day without board. There is not much change in the acreage of farm crops.

*Templeton* (LUCIEN GOVE). — The season promises better than for the last two or three years. Pastures and mowings are in good condition, and fall seeding wintered fairly well. Apples, pears and plums

show a normal bloom. There are very few insects in evidence at present, mostly tent caterpillars. Planting is progressing rapidly. Farm help is rather more plentiful than last year, but the quality is no better. Wages range from \$15 to \$30 per month with board and \$1.50 to \$2.50 per day without board. There is some increase in the acreage of corn and potatoes.

*Gardner* (W. E. KNIGHT). — The season is about a normal one. Grass in pastures and mowings looks well; fall seeding winter-killed badly. Apples are hardly in bloom as yet; no damage from frost. Tent caterpillars are doing some damage. Planting is progressing as usual. Good help is scarce, while foreign-speaking help is plenty, but poor. Wages range from \$12 to \$30 per month with board and average \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

*Winchendon* (ARTHUR STOCKWELL). — The season is very backward. Pastures and mowings are looking well. Frost has done some damage to fruit bloom. Gypsy moths are doing some damage in this locality. Planting is progressing finely. There is plenty of farm help at present. Wages are about the same as in former years. There are no marked changes in the acreage of the usual farm crops.

*Fitchburg* (JABEZ FISHER). — The season is fully as favorable as usual. Grass of all kinds has wintered well. The fruit bloom is the heaviest for many years, with no drawbacks; apple bloom two days earlier than the average of the past fifty-two years. Insects have not appeared in any numbers as yet. Planting is progressing well. Farm help is scarce, especially good help. Wages average \$20 per month with board and \$1.50 per day without board.

*Princeton* (A. O. TYLER). — The season is a little backward, but good for grass. Pastures and mowings are in good condition, and fall seeding wintered well. The fruit bloom compares favorably with that of former years, and so far has not suffered from frost. There are a few tent caterpillars doing damage. Planting is progressing well, but is not quite as far advanced as some years. Farm help is plenty this spring, and perhaps two-thirds of it is good help. Wages average \$20 per month with board through the spring and summer, and from \$1.50 to \$2 per day without board. There are no marked changes in the acreage of farm crops.

*Sterling* (HENRY S. SAWYER). — The season is two weeks earlier than usual. Grass in pastures and mowings is looking well. Apples bloomed well, also pears, peaches and plums, with no injury from frost. No insects are doing damage at present. Planting is progressing as rapidly as the weather will allow, with quite an acreage of potatoes planted. Farm help is more plenty than for several years, and one-half of it is fairly good help. Wages average \$20 per month with board and \$1.75 per day without board. There is about the same acreage as usual of farm crops.

*Shrewsbury* (FRED J. REED). — The season is about an average

one. Pastures and mowings promise well, but fall seeding did not winter very well. The fruit bloom was good; no damage from frosts. No insects have appeared as yet. Planting is nearly completed, except for corn. Farm help is plenty, and one-third of it good help. Wages range from \$25 to \$30 per month with board and average \$1.50 per day without board. There are no marked changes in the acreage of the usual farm crops.

*Southborough* (EDW. F. COLLINS). — The season is about normal at present. Pastures and mowings are looking well, much better than last year. About half the apple trees bloomed full; pears, peaches and plums made a full bloom. Insects are not doing any damage at present. The weather is favorable for planting, and the land in good condition. Help is more plenty and more willing than usual. Wages range from \$22 to \$28 per month with board. There will be a larger acreage than usual in corn and potatoes, farmers being disposed to do more than for the last two years.

*Leicester* (H. H. KINGSBURY). — The season is a little backward, excepting the fruit bloom, which is earlier than usual and very abundant. Pastures and mowings are in fine condition, and promise good yields. There is no damage from insects, owing to cool, damp weather. Planting is progressing slowly, being frequently interrupted by rain. Farm help is more plenty than for some years past. The high price of grain and the low price of milk are incentives to increase home production of feed for dairy stock, and many farmers plan to raise more oats and corn than usual.

*Auburn* (WM. GILBERT). — The season is a little late, but early vegetables are doing well. Pastures and mowings promise a big hay crop, and fall seeding wintered well. All fruit trees bloomed full, and there has been no damage from frosts. Insects are not doing much damage. Potatoes are all planted, and about half the corn. There is plenty of help this season, and about one-third of it good help. Wages average \$22 per month with board and \$40 per month without board. There will be a slight increase in the corn acreage. The number of milch cows is considerably decreased.

*Mendon* (J. J. NUTTER). — There is no particular difference in the season from former years. Pastures are looking very well, but mowings need rain; fall seeding wintered well. The fruit bloom is more extensive than last year, with no damage from frost. There is no particular damage from insects. Some farmers are nearly through planting, while others are not. There is plenty of help to be had. Wages range from \$15 to \$25 per month with board and average \$1.50 per day without board. There will be no marked change in the acreage of farm crops.



## MIDDLESEX COUNTY.

*Marlborough* (E. D. HOWE). — The season is about a normal one. Pastures and mowings need warm rains; fall seeding wintered well. Apples, pears, peaches and plums show a full bloom; small fruits just commencing, with promise good; no damage from frosts. Brown-tail moths and tent caterpillars are doing some damage. Planting is well advanced, probably up to the normal. There are plenty of mill hands looking for work on farms, and a fair amount of good help is obtainable. Wages average \$25 per month with board and \$1.75 per day without board. There are more potatoes put in than usual.

*Stow* (GEO. W. BRADLEY). — The season is about up to the average. The promise for pastures and mowings is good, and fall seeding wintered well. There is an average fruit bloom, and no signs of injury from frost. A very few tent caterpillars are doing damage. Planting is progressing well, much corn having been planted and some potatoes being up. Farm help is scarce, and very poor. Wages range from \$12 to \$30 per month with board and \$1.50 to \$2.25 per day without board. There will be an increased acreage of corn and potatoes.

*Littleton* (GEO. W. SANDERSON). — The season compares very favorably with the normal. Pastures and mowings promise well, and fall seeding wintered well. There was an excellent fruit bloom, and no damage from frost. The tent caterpillar is the only insect that has appeared. Planting is progressing well. There is more farm help than last year, and it is better help. Wages average from \$20 to \$25 per month with board and \$35 per month without board. There is no marked change in the acreage of farm crops.

*Westford* (J. W. FLETCHER). — The season is fully up to the normal. Grass never looked better at this time of year. Early apples bloomed full, and pears and peaches show full blooms; no damage from frost. Planting is about two weeks further advanced than last year. Farm help is plenty. Wages average \$20 per month with board and \$35 per month without board. There will be no marked changes in the acreage of the usual farm crops.

*Dunstable* (A. J. GILSON). — The present season is a little ahead of a normal season. Pastures and mowings never looked better at this time of year; some fall seeding wintered well, while in other locations it winter-killed badly. The bloom of all kinds of fruit has been abundant, with no damage from frost. Tent caterpillars are the only insects doing damage at present. Planting is progressing rapidly, and will be completed in a few days. Farm help is more plenty than it has been for two or three years past, and about one-fourth of it is good help. Wages average \$1.25 per day with board

and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

*Tewksbury* (G. E. CROSBY). — The season compares well with a normal season. Pastures, mowings and fall seeding are all doing well. There is a full bloom of apples and peaches; pears not as full as last year. Tent caterpillars and brown-tail moths are doing some damage. Planting is progressing rapidly. Wages range from \$15 to \$25 per month with board and \$1.25 to \$1.75 per day without board. More men are asking for work than formerly, but they do not seem over-anxious. There will be an increased acreage of cultivated crops.

*Concord* (WM. H. HUNT). — The season is ten days earlier than last year. Pastures and mowings look very well, and fall seeding has wintered well. Fruit trees have had a full bloom, and there has been no frost severe enough to do damage. Insects have not done much damage as yet. Planting is rather ahead of last year. Farm help is not scarce, more poor help being available than for some years. Wages average \$20 per month with board and \$35 per month without board. There is about the usual acreage of cultivated crops.

*Lincoln* (C. S. WHEELER). — The season is ten days late. Pastures and mowings are in good condition, and fall seeding generally wintered well. There was an extra good bloom on apples and peaches, and no injury from frost. Gypsy moths and asparagus beetles are doing some damage. Planting is progressing slowly. Help is in better supply than last year, and about one-third of it is good help. Wages average \$20 per month with board and \$37.50 per month without board. There are no marked changes in the acreage of farm crops.

*Winchester* (SAMUEL S. SYMMES). — Much more planting has been done than usual at this date. Pastures and mowings are in fine condition, and fall seeding wintered well. The bloom of all kinds of fruit was very heavy, and there have been no frosts since blooming. Cut worms are very plenty, and gypsy moth caterpillars are already at work. This has been the best spring for planting for many years. Help is very plenty, but not over one-third of it is good help. Wages average \$25 per month with board and from \$9 to \$10 per week without board. A good many market gardeners are growing pansies. The market for all vegetables has ruled low, early greens selling for less than cost of raising.

*Stoneham* (J. E. WILEY). — The season is a fair average one, agriculturally speaking. Pastures and mowings are in good condition, and fall seeding wintered well. There was a good bloom on apples and peaches, and a heavy bloom on pears. No insects have appeared as yet. Planting is progressing well. Farm help is scarce, and one-fourth of it good help. Wages average \$20 per month with board and \$35 per month without board. There are no marked changes in the acreage of farm crops.

*Newton* (G. L. MARCY). — The season is a normal one. Pastures and mowings are in good condition, and fall seeding wintered well.



There was a full fruit bloom, and no damage from frosts. No insects have appeared as yet. Planting is progressing fairly well. There is plenty of poor, inexperienced help from shops and mills, but good help is very scarce. Wages range from \$15 to \$25 per month with board and \$6 to \$10 per week without board. Many farmers have sold their cows or reduced the number kept, and more ear milk is being sold, most people preferring cheap milk to good milk.

#### ESSEX COUNTY:

*Salisbury* (WESLEY PETTENGILL). — Pastures and mowings are looking well, and fall seeding wintered well. There was a full bloom of all kinds of fruits and small fruits, with no injury from frost. There are a few tent caterpillars doing damage, but not as many as usual. Planting is late, owing to cold weather. Help is more plenty than usual, but not more than half can be called good help. Wages range from \$20 to \$25 per month with board and \$1.50 to \$2 per day without board. There will be more corn planted than usual.

*North Andover* (PETER HOLT). — The season is just about a normal one. Pastures and mowings look well, but fall seeding was badly thrown out by freezing of the ground last winter. There is a full bloom on all fruit trees, and no damage from frost. Brown-tail moths are doing some damage. Planting is well advanced. There are plenty of men looking for work, but *help* is just as scarce as ever. Wages range from \$20 to \$25 per month with board and \$1.50 to \$1.75 per day without board. There have been more gardens planted in the villages than for many years, owing to so many men being out of employment.

*Andover* (MILO H. GOULD). — The season is a little later than usual. Pastures and mowings are in good condition, but fall seeding did not winter well. The fruit bloom is abundant, with no damage from frost. Tent caterpillars are doing some damage. Planting is just beginning. Farm help is more plenty than for the past few years. Wages average \$20 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

*Hamilton* (G. R. DODGE). — The weather has averaged cool, and the season is later than usual. Pastures and mowings are looking well, but fall seeding did not come through the winter well. There is a full bloom of all tree and bush fruits, and no apparent injury from frost. The tent caterpillar is doing the usual amount of damage, and the gypsy moth seems to be gaining ground, but the brown-tail moth is not much in evidence. Planting is pretty well advanced. Farm help is not plentiful, and is only fair in quality. Most farmers hire by the day, paying \$1.75 or \$2 without board. Some farmers are putting in corn for grain, otherwise no marked changes in the acreage of farm crops.

*Wenham* (N. PORTER PERKINS). — Everything has come forward rapidly the past ten days, and is now as advanced as usual. Only the best mowing fields are looking well, old fields being very slim; pieces seeded last fall needed additional seed this spring. Fall apples bloomed well, but not the Baldwins; peaches, plums and small fruits made a fair bloom; wild berries large. Insects are as prevalent as usual, but little damage shows as yet. Planting is about half completed. Farm help is rather more plenty than usual, but not more than one-third of it is good help. Wages range from \$15 to \$25 per month with board and \$1.50 to \$1.75 per day without board. More potatoes than usual are being planted. A number of farmers have sold their cows, owing to high price of grain and uncertain returns.

*Manchester* (JOHN BAKER). — The season is a week further advanced than usual. Pastures and mowings promise well. There is a heavy bloom on all fruits, and no damage from frosts. Gypsy and brown-tail moths are doing some damage. Planting is progressing well. Farm help was never so plentiful as now. Wages average \$1 per day with board and \$2 per day without board. There will be no marked changes in the acreage of the usual farm crops.

#### NORFOLK COUNTY.

*Cohasset* (ELLERY C. BATES). — The season started late, but owing to extra warm weather, with plenty of showers, crops have been forced so that they are advanced beyond the normal. Pastures and mowings are in good condition. There was a heavier fruit bloom than usual, with no damage from frost. No insects are doing damage at present. Planting progressing well. Farm help is scarce, but what there is is good help. Wages average \$20 per month with board and \$1.75 per day without board. There will be the usual acreage of the usual crops.

*Norwood* (FRANK A. FALES). — The season is two weeks late. Pastures and mowings are looking finely, and fall seeding wintered well. There was a very light bloom of all fruits, and many young apple and pear trees died the past winter. No insects are doing damage as yet. Planting is about two weeks late. Farm help is rather more plenty than last year, and 70 per cent of it is good help. Wages average \$24 per month with board and \$1.75 per day without board. The acreage of corn will be increased 30 per cent, on account of high prices of grain.

*Walpole* (EDWARD L. SHEPARD). — The season compares favorably with the normal. Pastures and mowings are in good condition, and fall seeding looks fairly well. There was a full fruit bloom, with no damage from frosts. Planting is nearly completed. There is more help to be had than for the past few years. Wages average \$20 per month with board and \$2 per day without board. There is about the usual acreage of the common farm crops.

*Millis* (E. F. RICHARDSON). — The season is earlier and more for-

ward than usual. Pastures and mowings look well, but the winter was a hard one for fall seeding. The fruit bloom was better than average, with no damage from frost. No insects are doing damage as yet. Planting is progressing finely. Farm help is plenty, and half of it is good help. Wages range from \$25 to \$30 per month with board and \$1.50 to \$1.75 per day without board. More corn will be planted than usual.

*Norfolk* (A. D. TOWNE). — The season is about a normal one. Fall seeding wintered well, and mowings and pastures are above the average. Apples, pears, peaches and plums made a full bloom, small fruits not in full bloom as yet. A few tent caterpillars and elm beetles have appeared, but have done no damage as yet. Potatoes and garden truck is planted, but not much has come up yet. Farm help is more plenty than usual, but there is very little that can be called good help. Wages average from \$20 to \$25 per month with board and \$1.75 to \$2 per day without board. Rather more market-garden crops than usual have been put in.

*Franklin* (C. M. ALLEN). — The season is more favorable than the average. Pastures and mowings look well, and fall seeding wintered fairly well. There was a fine fruit bloom, and no damage from frost. Insects are not doing any noticeable damage. Planting is nearly completed. Farm help is plenty, but only about 10 per cent is good help. Wages average \$25 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

#### BRISTOL COUNTY.

*Mansfield* (WM. C. WINTER). — The season is about a normal one. Pastures and mowings are looking well, and what little fall seeding was done is also looking well. The fruit bloom is up to former years; Japanese plums suffered severely from frosts, other fruit but little. Little insect damage is apparent except from currant worms. Planting is progressing favorably. There is enough farm help to meet requirements, and it is generally fairly good. Wages range from \$1.50 to \$1.75 per day without board. There will perhaps be a slight increase in the acreage of corn and potatoes.

*Attleborough* (ISAAC ALGER). — The season is a full average one. The grass crop is very promising. Summer and fall apples have blossomed well, but Baldwins poorly; no damage from frost. No insects are doing damage as yet. Planting is progressing finely. Farm help is plenty. Wages average \$20 per month with board and \$1.50 per day without board. More corn is being planted than usual; acreage of other crops about as usual. On account of dry weather last year the crop of strawberries will not be a large one.

*Rehoboth* (ADIN B. HORTON). — The season is more favorable than an average one. Pastures and mowings are not up to the average; fall seeding wintered well. The fruit bloom is as good as I ever saw; no frosts. San José scale and cut worms are doing some damage.



Planting is progressing very well. Farm help is plenty, and two-thirds of it is good help. Wages average \$20 per month with board and \$1.50 per day without board. There is an increased acreage devoted to market-garden crops.

*Swansca* (F. G. ARNOLD). — We have had a dry spring, but with heavy showers on May 22; crops growing well. Pastures look well, and mowings fair; fall seeding wintered well. All fruit trees bloomed well, and we have had no frost. A few tent caterpillars are all the insects that have appeared. Planting is nearly finished. Help is more plenty than last year, with quality about the same as usual. Wages average from \$18 to \$25 per month with board; \$30 per month without board, but with tenement; and \$1.50 per day without either. There will be an increased acreage of corn and potatoes.

*Westport* (ALBERT S. SHERMAN). — The season is not up to the average, and crops are backward. Pastures and mowings are in good condition, and fall seeding wintered well. Apples made a good bloom; other fruits poor bloom; no damage from frosts. No insects have appeared as yet. Nearly everything is planted except root crops. Good help is scarce, and poor help is always plenty. Wages average \$22 per month with board and \$1.50 per day without board. The acreage of farm crops is about the same as usual.

*Acushnet* (M. S. DOUGLAS). — The season is more than normal at present. Pastures and mowings are in good condition, and fall seeding wintered well. There was a large fruit bloom, and the largest fruit crop for years is promised. No insects are doing damage at present. Almost all planting is done. There is plenty of help, but not much of it is experienced. Wages average \$20 per month and \$1.25 per day without board. More potatoes than usual have been put in. Early vegetables are lower than last year, but prices are higher; asparagus crop unusually heavy.

#### PLYMOUTH COUNTY.

*Norwell* (HENRY A. TURNER). — The season is about a normal one. Pastures are looking well, and there was very little grass winter-killed. There has been a good bloom for most fruits, and they have not been injured by frosts. Planting is progressing fairly well. Good farm help is scarce. There is not much change in the acreage of farm crops. Everything looks prosperous for a good season.

*Marshfield* (JOHN H. BOURNE). — The season is a little late, with less than the normal rainfall. The promise for pastures and mowings is very good, with continued rains, — even light rains. The bloom was very full for most fruits except Baldwin apples. Tent caterpillars have appeared. The ground and weather have been favorable for planting. Good help is scarce, but not as much so as last year. Wages average \$20 per month with board and \$1.75 per day without board. More corn will be planted than usual.

*Brockton* (DAVIS COPELAND). — The season is about an average one. There is a fairly good promise for pastures and mowings, but fall seeding did not winter well. The fruit bloom is fully up to the average. Currant worms are doing some damage. Planting is progressing well. Farm help is very plenty, but only a small proportion of it is good help. There is not much difference in the acreage of farm crops. Quite a colony of gypsy moths have been discovered, but have been taken care of.

*East Bridgewater* (GEORGE E. WALSCHEIDORF). — The season is better than a normal one. Pastures are in good condition; mowings promise a good crop; but fall seeding is late and in poor condition. The bloom on fruit trees and huckleberries was good. There are some tent caterpillars and gypsy moths doing damage. Planting is nearly completed. Farm help is fairly plenty, mostly from the factories. Wages range from \$20 to \$25 per month with board and from \$1.75 to \$2 per day without board. The acreage of cultivated crops will be greater than usual.

*Lakeville* (NATHANIEL G. STAPLES). — The season compares very favorably with the normal. Pastures are looking well, and fall seeding fairly well. There is a very full bloom of all kinds of fruit. No insects are doing serious damage. Planting is progressing very well. Farm help is rather scarce, and not more than one in ten is good help. Wages average \$20 per month with board and from \$1.75 to \$2 per day without board. There will be little change in the acreage of the usual farm crops.

*Carver* (J. A. VAUGHAN). — The season compares well with the normal. Pastures and mowings are in good condition, and fall seeding wintered well. There is a full bloom of all fruit trees, and no frost to injure them. Insects are doing no damage as yet. Planting is progressing well. Help is plenty, but most of it is not accustomed to farm work. Wages average \$1.65 per day without board. There are no changes in the acreage of farm crops.

*Wareham* (A. B. SAVARY). — The season is about a normal one. Pastures and mowings look well, but will soon need rain; fall seeding wintered well. There is a full fruit bloom, with no damage from frosts. Cut worms are doing much damage, and are on the increase. Planting is progressing faster than usual. Farm help is scarce, and about 20 per cent of it is good help. Wages average \$25 per month with board and \$1.75 per day without board. There will be no marked changes in the acreage of the usual farm crops.

#### BARNSTABLE COUNTY.

*Bourne* (DAVID D. NYE). — The season compares favorably with the normal. Pastures and mowings look as well if not better than usual. Fruit of all kinds seems backward, but is coming along quite well. There are no insects doing damage at present, except now

and then a gypsy moth. Planting is getting along quite well. Help is scarce, but there are plenty of green Portuguese to be had. Wages average \$20 per month with board and \$40 per month without board. There are no marked changes in the acreage of farm crops. Many have gone into making small cranberry bogs.

*Falmouth* (D. R. WICKS). — The season is still behind the normal, but vegetation is pushing ahead rapidly. Mowings and pastures are looking finely, but we need rain; fall seeding wintered well. There is a full bloom of all kinds of large and small fruits, and no frost. Currant worms are doing some damage. Early planting is entirely completed. There is no American help to be had, all Portuguese. Wages range from \$1.75 to \$2 for eight hours' work. There are no marked changes in the acreage of farm crops.

*Dennis* (JOSHUA CROWELL). — The season is about a normal one. Pastures and mowings are looking well. There is a full bloom for all fruits except Baldwin apples. Tent caterpillars are doing some damage. Planting will be completed this week. There is the usual supply of help, and half of it is good help. Wages range from \$30 to \$35 per month with board and average \$2 per day without. There will be an increase in the acreage of corn. Asparagus culture is having quite a boom.

*Harwich* (AMBROSE N. DOANE). — The season is about a normal one. Pastures and mowings promise fairly well; very little fall seeding here. The fruit bloom is good, with no injury from frost. No insects of any account have made an appearance as yet. Planting is progressing about as usual. Farm help is scarce, and there is very little good help. Wages average \$25 per month with board and from \$35 to \$40 per month without board. The acreage of the usual crops will not vary much from former years.

*Wellfleet* (E. S. JACOBS). — The season is a very good one to date. The outlook is for a much larger hay crop than in recent years. There is no frost and an abundant fruit bloom, both for apples and small fruits. Tent caterpillars are doing some damage. All fields have been planted except a few low, wet fields, and planting is ten days in advance of last year. Farm help is very scarce and very poor. Wages average \$20 per month with board and \$30 to \$35 per month without board. There will be no changes of moment in the acreage of farm crops.

*Truro* (JOHN B. DYER). — The season is a fairly good one. Pastures and mowings promise well, with reasonable rainfall; very little fall seeding hereabouts. The fruit bloom was good, particularly for peaches. Insects are about as numerous as usual. Planting is progressing well. There are few farms here requiring help, and that mostly employed is young boys, from fifteen to twenty years of age, fairly good for their kind. Wages range from \$15 to \$20 per month with board and 15 to 20 cents per hour without board. There is no special change in the acreage of farm crops.



## DUKES COUNTY.

*West Tisbury* (GEO. HUNT LUCE). — The season is later than the normal. Pastures and mowings promise well; very little fall seeding done here. The fruit bloom was later than usual, and has not suffered from frost. Tent caterpillars are doing some damage. Planting is progressing rapidly. Farm help is rather scarce, and about one in four good help. Wages average \$20 per month with board and \$2 per day without board. There is not much change in the acreage of the usual farm crops.

## NANTUCKET COUNTY.

*Nantucket* (H. G. WORTH). — The season is about ten days late. Mowings and pastures are looking well; not much fall seeding done here. There is no fruit raised in this county. Tent caterpillars are the only insects in evidence. Planting is well up with the season. Help is a little more plenty than usual, but only one-fourth of it is good help. Wages average \$25 per month with board and 20 cents per hour without board. The Burgess Cranberry Company are putting in a number of acres more of cranberry bog, and they now have the largest bog in the State.

## BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

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### POTATO-GROWING SUGGESTIONS.

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By CHAS. D. WOODS, Sc.D., *Director, Maine Agricultural Experiment Station.*

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While potato growing is somewhat a matter of soil and climate, it is even more dependent upon the ability, knowledge and energy of the man who is trying to grow them. This fact was very clearly demonstrated in Aroostook County, Maine, in the season of 1907. Aroostook County is perhaps the richest agricultural county in the United States, and the potato is the money crop. Upwards of 11,000,000 bushels of potatoes were shipped from the crop of 1906, besides all that went into starch. The shipments from the crop of 1907 was less than half that of the preceding year. And yet the good farmers had as large and in some instances larger crops than in 1906. The season of 1906 was favorable for a large crop, and everybody that planted potatoes succeeded in growing and harvesting a good crop. The season of 1907 was unfavorable, and only the good farmers had good crops. The men who thoroughly prepared the seed bed, on well-selected soil, planted only what they could properly care for, who used fertilizer liberally, cultivated all the season, and who sprayed early and often against insect and fungous enemies and harvested as soon as the crop was ready, not only had a large yield per acre, but the high prices that ruled for potatoes after the poorly grown early ones were marketed brought it about that with many Aroostook farmers the season of 1907 was the best for years. On the other hand, the farmer that planted illy adapted and slovenly prepared land, of larger area than he could well care for, who neglected to spray because the weather was not favorable for the spray to adhere, who had so many acres he could not get them harvested before the unusually early freezing of the ground (over 11,000 acres of potatoes were frozen in and remained unharvested in Aroostook County in 1907), found the year a disastrous one. In many instances the crop harvested was not sufficient to pay the fertilizer bills.

By practising the methods of the *good* farmers of Aroostook County, many men in other parts of Maine are successful with potatoes as a money crop. There is no reason why men in Massachusetts may not grow the potato at fully as good a margin of profit as the farmer in Maine.

#### THE POTATO DEMANDS CONSTANT CARE.

At the annual meeting of the Massachusetts State Board of Agriculture, in 1901, the writer in answer to a question said, in part: "If he plants a few potatoes, there is not one farmer in twenty but what something else would crowd in, and he would let the potatoes

go. The one great reason we grow better potatoes in Aroostook County than elsewhere in Maine and Massachusetts is that it is the farmer's business to grow his potatoes. He does not keep cows, and he is not obliged to feed his cows or milk them; and there isn't anything he has to do but to take care of his field of potatoes, and that field will have from 20 to 50 acres in it. He keeps one man and a pair of horses working on each 20 acres from spring until fall, and this one man and pair of horses will care for the 20 acres, and he doesn't attempt to do anything else. That is one of the reasons we grow potatoes better, — because we are growing them for business. The potato growers are not thinking of the dairy cow or the breed of sheep; they are thinking about growing potatoes. When I used to live in Connecticut, up and down this Connecticut Valley there were men that ate, drank and slept tobacco; and so there are men that eat, drink and sleep potatoes in Aroostook County."

#### NO ONE BEST METHOD OF POTATO CULTURE.

The potato is so generally and so extensively grown, we are so familiar with its qualities and the various methods of culture, that most farmers are very positive as to the best method of growing this crop. During the past twenty-five years hundreds of experiments have been made at experiment stations and by practical growers, and the results from experiments in propagation and culture are so conflicting that the careful student will be very slow in drawing conclusions. While he will be convinced that there are ideal ways of treatment under certain conditions, he will be equally convinced that under different conditions very different practice will be necessary to insure the best crop. In potato growing, as with most farm operations, the soil and atmosphere are such determining factors that there is no best way. Each farmer who would grow potatoes to the best advantage must be sufficiently intelligent to understand the conditions of the soil on his own farm. The methods of preparation of soil, of planting, cultivating and fertilizing the crop, depend largely on the character and condition of the soil and the season.

#### A FEW POINTS TO BE OBSERVED.

The successful growing of the potato crop demands careful and conscientious work from start to finish. There are many details which if neglected mean partial failure, and which must be cared for in order to insure the fullest success. It is not practicable in a short article to hint at more than a very few factors which enter into successful potato growing.

Among the most important are: the selection and the preparation of the soil, including application of fertilizer; the seed and the care of the crop during the growing season.

#### *The Soil.*

A soil to grow potatoes well must be in an excellent state of tilth, sufficiently mellow to make a good seed bed and place for the tubers to develop. Abundant plant food must be supplied, and the land must be so situated that it will not suffer if rain should be excessive, and must, on the other hand, be well adapted to stand drought. If not naturally well drained, it must be underdrained. If it is not of good water-holding capacity, this must be secured by increasing the humus by green manuring or the use of liberal quantities of stable manure.

*Water a Necessity.*

There is no farm crop that is more easily, speedily and greatly affected by the supply of moisture than is the potato. It has been found by experiment that it takes about 425 tons of water to grow a ton of dry matter of potatoes. A crop of 200 bushels per acre would therefore require approximately 650 tons of water, — equivalent to a rainfall of nearly 6 inches. Because of its need for large water supply, and its remarkable susceptibility to climatic conditions, it follows that the average potato yield is affected more by water supply than by lack of plant food. The selection of soil and methods of culture must be with this fact in view, if success is to be had. The liberal application of fertilizers or the presence of large amounts of readily available plant food will prove of but little value if the moisture supply is deficient. It is also true that too much water will check the growth as quickly and effectually as too little.

Too much attention to the fitting of the soil for the crop can hardly be given, for no amount of after-tillage can overcome neglect in preparation. Deep and thorough plowing and harrowing, so as to make a perfect seed bed, not only establishes an earth mulch, so as to prevent the loss of moisture of the spring rains, but it so fines the soil that the plant food contained in it becomes accessible to the growing plant. The conservation of moisture by frequent tillage is not understood or practised as it should be. The old notion that potatoes should be hilled, and that tillage should cease as soon as the potato is in bloom, is wrong for most situations. Hilling is frequently practised so as to keep the tubers from becoming exposed to the sun; this is not necessary if the soil was properly prepared. On hard, compact soil the potato will, because of less resistance of the soil, push out of the ground. This will not happen in deeply worked land.

*Preparation of Soil.*

The proper preparation of a soil for the potato crop is a matter of years, and not a single season. A soil in order to do the best must be in an excellent state of tilth and a high state of fertility. Such conditions can be obtained only by careful forethought and planning. In many instances the soil is not plowed deeply enough. It is very common for people to speak of plowing 7, 8, or even 9 inches; but most men would be surprised if they were to apply a rule to see how much short of this depth the plow goes below the actual level of the field. Many men that think they are plowing 7 or 8 inches deep are only plowing 5 inches. If this shallow plowing has been practised, it is bad management to suddenly deepen the plowing, as this brings too much of the sub-soil to the surface in a single plowing.

Good potato land may be handled in a three or four year rotation, — potatoes, grain, grass one or two years, and then potatoes again, in some such way as the following: land which is used for potatoes should immediately after harvesting of the crop be treated to a liberal application of farm manure, if it can be obtained, and plowed with lap furrow. The plow can well run an inch deeper than it did the preceding year, when the land was prepared for potatoes. In the spring the soil will have crumbled by the frosts, and should then be thoroughly and deeply worked by frequent harrowings with some such tool as a disc or spading harrow. It should then be smoothed with an Acme harrow or some similar tool, and seeded to grain. If it is designed to grow only a single crop of grass, it is best at the time of



seeding to sow clover with the grain. If, however, it is designed to remove two crops of grass, it can be seeded with a mixture of clover and timothy. The grain crop will be harvested the first year; the second season, the crop will be chiefly timothy; the third, it will be timothy and clover; and at the end of the two or three years, whichever plan is followed, there will be in the field in the fall a good stand of second-growth clover. This should not be cut or fed, but should be plowed under, and this is all the more important if the piece has not been treated with farm manure. This fall plowing should be with lap furrow, and the following spring it should be thoroughly worked with the disc and smoothing harrows, in order to get ready for planting.

It may in many situations be desirable to follow the grass crop with corn, and then follow with potatoes. The same thorough preparation will be of advantage to the corn crop. The land for the corn should be liberally fertilized. Farm manure may be again used to advantage at this point in the rotation. The corn crop must be overfed in every way, so that the land will be in a higher state of fertility at the end than at the beginning of the season. If corn enters into the rotation, fall plowing should be again practised, and the following spring the land should be thoroughly worked. The best possible seed bed should be prepared, so that the soil will be light and thoroughly pulverized to a depth of 5 or even 6 inches. In a soil thus prepared the planter will run easily.

#### *The Potato needs Abundant Plant Food.*

It is always profitable to fertilize a money crop liberally, and, while a crop of 300 bushels of potatoes will remove from the soil about 55 pounds of nitrogen, 25 pounds of phosphoric acid and 85 pounds of potash, it is probably wise to furnish the phosphoric acid in considerable excess and the potash in fair excess. The plowed-under clover and the fertility which has been accumulated can be depended upon for part of the nitrogen. By many experiments it has been found that the potato plant thrives best in a soil abundantly supplied with all fertilizing elements. In the early stages of growth nitrogen is particularly demanded, and hence a considerable part of the nitrogen should be in a readily available water-soluble form. This is necessary that it may be utilized by the plants early in the season. Later when the tubers are forming, there is special demand for phosphoric acid and potash.

#### *Selection of the Fertilizer.*

In the selection of a fertilizer, a farmer cannot be guided by the name alone. There are all kinds of "potato" fertilizers upon the market, — those carrying from 1 to 5 per cent nitrogen, from 5 to 10 per cent phosphoric acid and from 2 to 12 per cent potash. In selecting the fertilizer, something more than percentage composition must be taken into account.

At the present time a 4-6-10 fertilizer, carrying 4 per cent of ammonia, which is equivalent to 3.3 per cent nitrogen, 6 per cent available phosphoric acid and 10 per cent potash is a popular potato fertilizer in Maine. Used at the rate of 1,500 pounds to the acre, such a fertilizer would supply about 50 pounds of nitrogen, 90 pounds available phosphoric acid and 150 pounds of potash. Obviously such a fertilizer when compared with the needs of the crop is out of balance. As the results of field experiments with potatoes, it is prob-



able that the excess of phosphoric acid is valuable to the crop. There is no evidence, however, to show that the potato crop is benefited by such a great excess of potash. It would seem that if 1,500 pounds of a high-grade fertilizer is to be used, one carrying 6 or 7 per cent of potash in place of the 10 would be better balanced.

### *The Form of Fertilizing Ingredients.*

In 1907 a high-grade potato fertilizer was used in large quantities, in Maine, on potatoes, which did not carry any nitrate nitrogen. There was quite a general complaint as regards failure with this particular fertilizer, and much dissatisfaction, leading even to the threatening of law suits, because of the short crops supposedly due to this fertilizer. Careful examination of this fertilizer showed that its constituents were all high grade, and that, while it fell somewhat below its guaranteed analysis, it still was high-grade goods. The dissatisfaction and poor results from the use of this fertilizer were probably due to the absence of nitrate nitrogen. The grower in a climate where the growing season is so short must see to it that the fertilizer used, and particularly on the money crop, carries a fair proportion of its nitrogen in the form of nitrate nitrogen. Fully a third of the nitrogen in a fertilizer carrying 3.3 per cent nitrogen could with safety be in the form of nitrate. It would not do to have much more than that in the form of nitrate, because of the danger of loss from leaching out by heavy rains. From field experiments conducted by the Maine Experiment Station, it is not advisable to have much, particularly of dry mixed, *bone* tankage in the fertilizer, as it seems to stimulate the growth of the tops too late in the season. Where one can know relative to the source of the nitrogen, it is probably desirable to have about a third as nitrate nitrogen, and the rest in the form of dried blood or high-grade tankage. Sulphate of ammonia is a good source of nitrogen, becoming available more quickly than tankage, but is not as immediately available as nitrate of soda. While it is water soluble, there is not nearly the danger of loss by leaching as there is with the nitrate. It matters little whether the phosphoric acid is from bone or from rock phosphate; but it is necessary that in any case it be acid-treated, so as to be in the available form. There seems to be no difficulty as to the form of phosphoric acid and its availability in any of the high-grade fertilizers offered in New England. With certain crops, sulphate of potash gives better results than does *muriate*, and there is more or less of a general opinion that sulphate of potash produces better quality of potatoes. There is, however, very little evidence to support this conclusion. Practically all the potash in New England sold fertilizers is in the form of *muriate* or sulphate, and it seems to make little difference which form of these two is used.

### *Amount of Plant Food per Acre.*

Even on soil of high fertility, it is found profitable to fertilize liberally. For a large crop, the fertilizer should carry not less than 50 or 60 pounds of nitrogen, one-third of which should be in the form of nitrate, not less than 60 pounds of available phosphoric acid and not less than 100 pounds of potash. About two-thirds of this can best be applied in the drill at time of planting and the rest at first or second cultivation.

To most Massachusetts farmers this amount of plant food for the potato will appear excessive, but it is found profitable in practice.

### *Planting and Cultivation.*

On the whole, medium-sized potatoes cut into four pieces seem to be the best adapted for seed. These are planted at a fair depth with either of the planters which are in common use. Not more than 1,000 or 1,200 pounds of a fertilizer should be applied in the drill at the time of planting. The drills should be from 34 to 36 inches apart, and the pieces planted from 12 to 14 or 16 inches apart in the drill, according to whether it is a small or vigorous growing variety. All through the growing season the field should be kept free from weeds. The exaggerated ridge culture which is so common in Aroostook County could be better replaced in Massachusetts by a less pronounced ridge, or as level culture as is practicable. Suitable potato land is naturally or artificially so well drained that it does not suffer from excessive moisture, and with the high-ridge culture there is danger even in a moderately dry season of the crop suffering from lack of water. The frequent running of the cultivator not merely keeps down the weeds, but it lets the air into the soil and prevents excessive loss of moisture from evaporation, and in every way seems to be beneficial to the crop. This should be kept up until the vines pretty well cover the ground. If weeds are appearing in the drill, these should be removed by hand.

### *Spraying.*

Of everything which has to do with the care of the potato in its growing stage, there is nothing that is so important as the spraying, both to prevent blight and to protect from injury against insects. The following suggestions for fighting the enemies of the potato are condensed from a circular of the Maine Agricultural Experiment Station, and can be had on application to the Station at Orono, Maine.

### *Insect Enemies.*

The small black flea beetle eats minute holes in the leaves, sometimes making them look like the cover of a pepper box. Poisons have little effect upon it, or upon the mature Colorado beetles. Bordeaux mixture is very distasteful to both of these insects, and if thoroughly applied is a most effective agent in holding them in check.

The larvæ or slugs of the Colorado beetle (potato bug) can readily be killed by poisons. These poisons are best applied with water in the form of a fine spray just *before* the eggs hatch. The smaller the slug the easier it is killed.

If applied as a fine spray before the plants are badly infested,  $\frac{1}{2}$  pound of Paris Green, 2 pounds of Swift's arsenate of lead or 2 pounds of Bowker's Disparene per acre at each application will prove effective. Arsenate of soda (see Formula 11, p. 41) is a cheaper poison, but it must always be applied with Bordeaux mixture, never alone. In case the slugs are abundant, a second application may be necessary inside of two or three days. If the poisons are applied just before the eggs hatch, three applications at intervals of seven to ten days will usually be sufficient during the season. The poisons can be applied alone (Formula 3 or 4) or with Bordeaux mixture (Formulas 7, 8 and 11).

Caution: *Paris green poisons should never be used alone on potatoes except on the addition of from 3 to 5 pounds of unslaked lime to 50 gallons of spray, depending upon the amount of poison used.*

*Potato Scab.*

Potato scab, which is too well known to need description, can be held in check by planting previously treated seed in clean land. As it is very difficult to get this fungus out of the soil, great care should be taken not to get it in. Soak the uncut seed potatoes one and one-half hours in Formula 1, or two hours in Formula 2, and then spread out to dry. After drying, the potatoes may be cut and planted in the usual way, care being taken not to allow them to touch any box, bag or bin where scabby potatoes have been kept. Treatment with formalin is safer than corrosive sublimate, and on this account is preferred. All tubers treated with corrosive sublimate should be planted, to avoid danger from the poison on them. For the larger grower or seed dealer, disinfection by means of the formaldehyde gas method, as described under Formula 10, is the most satisfactory procedure.

*Early Blight.*

This disease (sometimes improperly called rust) seldom produces so much damage in any one year as does late blight. Nevertheless, it is widespread, and very destructive in that it attacks and weakens the plant at a critical period, thus checking the development of the tubers. It is confined to the foliage, and is not known to cause rot. Early blight first appears as small brown spots scattered over the older leaves. These slowly enlarge and frequently become somewhat angular in shape, from the fact that they stop on reaching a leaf vein. To control this disease, early, frequent and most thorough sprayings with Bordeaux mixture (Formula 6) are necessary.

*Late Blight or Rot.*

This disease is caused by a fungus which attacks both the foliage and the tubers. In this latitude it most frequently becomes epidemic during the damp, muggy weather of August and September; it does little damage during hot, dry weather. Late blight may be well distributed over a field before it is noticed, except by a trained observer. As a rule, it first appears on the lower and more shaded leaves, which are hidden from view. Contrasted with early blight, it is more of a leaf blotch than a spot disease. The diseased portions are brownish or blackish areas, the leaf green fading out as it approaches the spot, which rapidly enlarges and becomes moist and ill smelling. The margins of the under sides of such spots show a delicate frost-like mildew if examined on a moist, cloudy day or in the early morning. This is the fruiting portion of the fungus, and on each spot are produced thousands of little fruiting bodies, each capable of causing another spot.

The washing of late blight spores down into the soil is directly or indirectly the cause of much of the loss from rot of the tubers both in the field and in storage. The most common dry rot of the tuber in Maine is caused by this fungus. Thorough spraying with Bordeaux mixture (Formula 6), beginning before the blight appears, and keeping the foliage well coated till killed by frost or the crop is harvested, will reduce the losses from this disease to a minimum. No tubers showing dry rot should be planted.

*When to Spray and how to Spray.*

Begin when the tops are 6 or 8 inches high, and spray every ten days (every week, if the weather is very cloudy and rainy) until the last of August or the first of September, or later if necessary. In any



event, spraying must be begun some days before the average observer will detect blight on the leaves, and the foliage should be kept well coated with Bordeaux mixture up to the time the crop is harvested or the tops are killed by frost. Do not stop for rainy weather; this is just the time when late blight spores are formed in profusion, and when infection most easily takes place. It is possible for a spraying just before a rain, even though it is largely washed off, to do more actual good than any other during the season. Moreover, properly prepared Bordeaux mixture, if thoroughly applied, will withstand severe washing if it once thoroughly dries on the leaves. The best results are obtained when the mixture is forcibly applied in the form of a fine mist, *not* in coarse drops sprinkled over the foliage.

As is described elsewhere, the nozzles should be so arranged and of sufficient number and adjustments as to cover the entire row at each application. Do not limit the amount applied per acre to an arbitrary number of gallons, but use enough at each application to thoroughly coat the foliage, whether it requires 50, 100 or 150 gallons per acre. Use a pump powerful enough to develop a pressure of at least 60 pounds with all the nozzles open.

#### *Formulas for Scab.*

##### FORMULA 1.

Corrosive sublimate, . . . . .	2 ounces.
Water, . . . . .	15 gallons.

The corrosive sublimate dissolves readily in water. Immerse seed tubers for one and one-half hours in this solution.

##### FORMULA 2.

Formalin (40 per cent solution formaldehyde), . . . . .	8 fluid ounces.
Water, . . . . .	15 gallons.

Immerse seed tubers two hours in this solution.

##### FORMULA 10.

For disinfection with formaldehyde gas: —

Potassium permanganate, . . . . .	23 ounces.
Formalin (40 per cent solution formaldehyde), . . . . .	3 pints.

The above is sufficient for each 1,000 cubic feet of space. Place the seed tubers in bushel crates or shallow slat-work bins in a tight room; spread the potassium permanganate evenly over the bottom of a large pail or pan in an open spot in the centre of the room; pour the formalin over this, and give the dish one rapid tilt, to ensure thorough mixing; leave the room at once, and tightly close from without. The bins or crates should be so arranged that the gas can circulate on all sides of them and mix with the air of the room before it comes in contact with the potatoes. *To avoid injury from the strong gas as it is liberated, no potatoes should be placed directly above the generator.*

#### *Formulas for Beetles and Slugs.*

##### FORMULA 3.

Paris green, . . . . .	$\frac{1}{2}$ pound.
Lime (unslaked), . . . . .	3 pounds.
Water, . . . . .	50 gallons. <sup>1</sup>

The standard remedy for the destruction of insects which eat the foliage or fruit. The lime is added to prevent the Paris green from burning the foliage. Slack the lime in a little water, and make a thin

<sup>1</sup> An ordinary oil barrel holds about 50 gallons.

paste and strain; wet up the Paris green with a little water into a thin paste; mix the lime and Paris green and add the remainder of the water.

## FORMULA 4.

Lead arsenate or disparene, . . . . .	2 pounds.
Water, . . . . .	50 gallons. <sup>1</sup>

Arsenate of lead acts slower as a poison than Paris green, and for that reason is not so effective for killing insects on rapidly growing plants like potatoes. It can be kept suspended in the water better than Paris green. It does not burn the leaves, and sticks to the foliage better than Paris green. Make a smooth, thin paste with the poison and a little water, and add the remainder of the water and stir thoroughly.

*Formulas for Blights, — Bordeaux Mixture.*

## FORMULA 6.

Copper sulphate, . . . . .	5 pounds.
Fresh lime (unslaked), . . . . .	5 pounds.
Water, . . . . .	50 gallons. <sup>1</sup>

## FORMULA 6A.

Copper sulphate, . . . . .	5 pounds.
Hydrated lime (prepared or ground lime), . . . . .	6-7 pounds.
Water, . . . . .	50 gallons. <sup>1</sup>

Bordeaux mixture according to Formula 6 is prepared as follows: — the copper sulphate is dissolved and the lime slaked in separate vessels. A wooden or earthen vessel must be used for the copper sulphate, as it corrodes iron. Each solution should then be diluted with half the water, and then the *cold, dilute sulphate and milk of lime solution quickly united and thoroughly mixed*. Never pour concentrated solutions together. If impracticable to pour the two dilute solutions into the sprayer or mixing tank simultaneously, the dilute copper sulphate solution should be first placed in the tank and the dilute milk of lime solution quickly added with constant stirring.

Best results are obtained if care is taken to add the water slowly to the lime while slaking, but it should not be allowed to become dry. The milk of lime must be strained, and this is best done while still hot. A brass wire strainer of about 30 meshes to the inch (No. 50), or a piece of cheese cloth backed by common window screen, may be used. The best type of strainer can be made by nailing together four 1-inch boards about 7 or 8 inches wide and 12 or 15 inches long, making a box open at both ends. One end of the box is then cut off at a considerable angle, leaving one side shorter than the other. No. 50 brass wire strainer is tacked on to this end. Two cleats are nailed to the other end of the box, long enough to more than reach across the top of the barrel. When placed on top of a barrel with the wire bottom down, all the solid particles from the solution are washed to the lower side of the screen, thus avoiding clogging the whole surface.

The most convenient method of preparing Bordeaux mixture is to make stock solutions. For this purpose suspend 100 pounds of copper sulphate in a bag near the top of a 50-gallon barrel and fill with water. This should dissolve over night. In another 50-gallon barrel slake 100 pounds of stone lime, dilute and strain and make up to 50 gallons. A gallon of each solution *well stirred* will be equivalent to 2 pounds of copper sulphate or lime, as the case may be. For a 50-

<sup>1</sup> An ordinary oil barrel holds about 50 gallons.



gallon tank of mixture the stock solution should be thoroughly stirred, and then  $2\frac{1}{2}$  gallons of each dipped out, diluted and mixed as described above. For a 100-gallon tank 5 gallons of each stock solution is used, and each diluted to 50 gallons before mixing.

Bordeaux mixture according to Formula 6A is prepared in exactly the same manner as in Formula 6, except that slaking the lime and straining the resulting solution is dispensed with. The required amount of lime is weighed out, wet up with water, diluted, and then thoroughly stirred. Stock solutions of hydrated lime can also be used.

### *Formulas for Bugs and Blights.*

*Make a smooth paste of the poisons and a little water; add to the Bordeaux mixture and stir thoroughly; apply at once.*

#### FORMULA 7.

Paris green,	.	.	.	.	.	.	.	$\frac{1}{2}$ pound.
Bordeaux mixture,	.	.	.	.	.	.	.	50 gallons. <sup>1</sup>

#### FORMULA 8.

Lead arsenate or disparene,	.	.	.	.	.	.	.	1 pound.
Bordeaux mixture,	.	.	.	.	.	.	.	50 gallons. <sup>1</sup>

#### FORMULA 11.

Arsenate of soda stock solution,	.	.	.	.	.	.	.	1 quart.
Bordeaux mixture,	.	.	.	.	.	.	.	50 gallons. <sup>1</sup>

Arsenate of soda stock solution is prepared as follows: place 2 pounds of white arsenic and 8 pounds of sal soda in 2 gallons of water. Store in well-stoppered bottles or jugs with a poison label on them. This is a much cheaper poison than Paris green to use with Bordeaux mixture, and it remains in suspension better, but it is not safe to use it alone with lime. White arsenic costs less per pound than Paris green, and will go twice as far, in that 2 gallons of arsenate of soda stock solution will do as much execution as 4 pounds of Paris green.

### *Condensed Directions.*

*A. For Scab.* — Immerse the tubers one and one-half hours in a solution of corrosive sublimate (Formula 1), or two hours in formalin (Formula 2), or disinfect with formaldehyde gas (Formula 10).

*B. For Insects.* — Spray with a poison alone (Formulas 3 or 4). If flea beetles are numerous, or there is danger from blight, use combined Formulas 7, 8 or 11.

*C. For Blights.* — Begin to spray when the tops are 6 or 8 inches high, and spray thoroughly every ten days, — every week, if necessary. If insects are plentiful, use combined Formulas 7, 8 or 11. After danger of insects is passed, use Formula 6.

Usually six and sometimes four sprayings are sufficient to protect against late blight; but the leaves should show a coating of Bordeaux from the time spraying begins till the crop is harvested or the tops are killed by frost. One thorough spraying in rainy weather before late blight has gained a foothold may be the most effective application of the season. If early blight is prevalent, five or six *very thorough* sprayings, beginning early in the season, are necessary to insure sufficient protection.

<sup>1</sup> An ordinary oil barrel holds about 50 gallons.

## SUMMARY.

To successfully grow potatoes:—

Select highly fertile land, so situated that it will suffer as little as possible from either excessive rain or from droughts.

Thoroughly prepare the soil, and fertilize liberally.

Spray for insects and blight, early and often.

Keep the crop free from weeds and the surface of the soil loose during the whole season.

Do not let anything prevent the potato field from receiving constant care. Vastly more failures in potato growing in Massachusetts can be traced to neglect of crop than to lack of knowledge.







MASSACHUSETTS  
CROP REPORT

FOR THE

MONTH OF JUNE, 1908.

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SHEEP RAISING.

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*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF  
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER  
UNDER ACT OF CONGRESS OF JUNE 6, 1900.

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# CROP REPORT FOR THE MONTH OF JUNE, 1908.

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OFFICE OF STATE BOARD OF AGRICULTURE,  
BOSTON, MASS., July 1, 1908.

The crop report for July forms the second issue for the current year. At the close of this issue is an article on "Some Sheep Topics for Massachusetts," by Ray L. Gribbin, instructor in animal husbandry at the Massachusetts Agricultural College. Professor Gribbin is familiar with the conditions in the middle west, where sheep raising still forms an important branch of agriculture, and has many valuable suggestions to offer as to why and how it might be made equally important in New England in general and Massachusetts in particular. This valuable farm animal has been very much neglected in most parts of the State of late years, but the number of inquiries we have received on the subject shows a reawakening of interest, to stimulate and direct which this article has been secured. It is full of practical suggestions, and the advice given is along the line most likely to prove profitable in this section, that of lamb and mutton production.

## PROGRESS OF THE SEASON.

Preliminary returns of the Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for June, 1908) on the acreage of spring wheat sown indicate an area of 3.7 per cent more than the area sown last year, indicating a total area of about 17,710,000 acres, or 631,000 acres more than sown last year. The condition of spring wheat on June 1 was 95 per cent of a normal, as compared with 88.7 on June 1, 1907, 93.4 on June 1, 1906, and 93.2, the June 1 average of the past ten years. The condition of winter wheat on June 1 was 86 per cent of a normal, as compared with 89 on May 1, 77.4 on June 1, 1907, 82.7 on June 1, 1906, and 81, the June 1 average of the past ten years.

The area sown to oats was estimated to be .6 per cent less than the area sown last year, indicating a total area of about 31,644,000 acres, or 193,000 acres less than last year. The condition of the oats crop on June 1 was 92.9 per cent of a normal, as compared with 81.6 on June 1, 1907, 85.9 on June 1, 1906, and 88.9, the June 1 average of the past ten years.

The area sown to barley was estimated to be 3.9 per cent more than the area sown last year, indicating a total area of about 6,697,000 acres, or 249,000 acres more than last year. The condition of the crop June 1 was 89.7 per cent of a normal, as compared with 84.9 on June 1, 1907, 93.5 on June 1, 1906, and 89.5, the June 1 average of the past ten years.

The condition of rye on June 1 was 91.3 per cent of a normal, as compared with 90.3 on May 1, 1908, 88.1 on June 1, 1907, 89.9 on June 1, 1906, and 90, the June 1 average of the past ten years.

The condition of meadows (hay) on June 1 was 96.8 per cent of a normal, as compared with 93.5 on May 1.

The condition of pastures on June 1 was 97.7 per cent of a normal, as compared with 92.6 on May 1, 80.6 on June 1, 1907, and 91.3, the June 1 average of the past ten years.

#### TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM NATIONAL WEEKLY WEATHER BULLETIN.]

*Week ending June 8.* — The mean temperature was below the normal in the Pacific coast, Plateau and Rocky Mountain regions, and generally in the Atlantic coast States northward of Georgia. In the Atlantic coast districts the deficiency was generally less than 3°. The temperature was nearly normal in the Missouri, central Mississippi and Ohio valleys, Tennessee and the greater part of the east Gulf States. The temperature was above normal in the west Gulf States and the upper Lake region and upper Mississippi valley, ranging from 3° to 9° per day in excess. Very heavy rains occurred in extreme northern Texas, Oklahoma, the eastern portions of Kansas, Nebraska and South Dakota, and in portions of the South Atlantic and east Gulf States,



amounts ranging from 2 to more than 8 inches. The precipitation was less than the normal from the upper Mississippi valley eastward to the New England and Middle Atlantic coasts.

*Week ending June 15.* — The mean temperature was below the normal in the northern Rocky Mountain region, central valleys and most of the Lake region, the deficiency ranging from  $6^{\circ}$  to  $11^{\circ}$  per day in the central valleys and Lake region. The temperature was nearly normal in the South Atlantic and Gulf States, and above the normal over the greater part of Washington and Oregon, in the Rio Grande valley, New England and generally throughout the Middle Atlantic States, the excess ranging from 2 to 6 per day. Heavy rains occurred in the central Gulf States, Oklahoma, Arkansas, Kansas, Nebraska and portions of Iowa and Missouri, the amounts ranging from 2 to 4 inches. There was more than the normal amount over the Lake region, the interior portions of the Middle and South Atlantic States, the lower Lake region and the western portion of the upper Lake region. Elsewhere there was less than the normal amount of rain.

*Week ending June 22.* — The mean temperature was below the normal in the Pacific coast, Plateau and Rocky Mountain regions and portions of the lower Missouri valley, along the South Atlantic coast, and in interior districts northward to northern New York and western New England. In the eastern districts the temperature deficiency was not marked, being less than  $3^{\circ}$  per day. The temperature was practically normal over the central Gulf States and the eastern portions of the Dakotas, and slightly above in the lower Lake region and central valleys. The rainfall was generally above the normal over the middle Plateau and Rocky Mountain regions, in portions of the central valleys, over most of Ohio and along a narrow strip from the Massachusetts coast to the interior of North Carolina. Elsewhere it was below the normal, the deficiency being most marked in the central Mississippi and lower Ohio valleys and central Gulf States.

*Week ending June 29.* — The mean temperature was be-

low normal over the Middle and South Atlantic States, and throughout the entire region from the upper Mississippi and lower Missouri valleys southward to Texas and westward to the Pacific. In northern districts there was a marked excess of temperature from  $2^{\circ}$  to  $4^{\circ}$  per day from the upper Lake region eastward to southern New England. The rainfall was heaviest over interior Minnesota, northern and west Missouri, in interior Connecticut and scattered districts elsewhere. In the remaining districts the rainfall was generally less than the normal.

### SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

*Week ending June 8.* — New England. Boston: The weather was clear and pleasant, the sunshine being much above average. There was very little rain, except in Penobscot, Cumberland and Kennebec counties in Maine, where copious showers occurred on the 1st. The weather was seasonable. The nights were cool. Frost was general in the interior on the night of the 2d, when the temperature fell to 30 in some localities.

*Week ending June 15.* — New England. Boston: The weather was clear. No rain occurred, except a few scattered light showers on the 11th. The ground is dry, and drought is becoming serious. Copious rains are greatly needed, no rain of any amount having fallen this month over the greater part of New England. The sunshine and mean temperature were much above the normal.

*Week ending June 22.* — New England. Boston: One or 2 inches of rain fell in Vermont, the Connecticut valley and sections of New Hampshire, somewhat more than 1 inch in Rhode Island, and .4 to .6 inch in the remainder of New England on the 16th; the remainder of the week was fair, with sunshine above the average. Cool nights prevailed during the middle of the week. Maximum temperatures were high during the last three days. Hot sunshine and strong winds the last half of the week have dried the ground, making copious rains now needed.

*Week ending June 29.* — New England. Boston: Showers

and thunderstorms were general on the 24th, but the rainfall was small; except that more than 1 inch fell in parts of the central and western portions of Massachusetts and Connecticut. Over the remainder of New England drought continues with increasing severity. The mean temperature was slightly above the normal. The sunshine was above the average.

#### WEATHER OF JUNE, 1908.

The month as a whole was exceptionally pleasant, there being an unusual prevalence of sunny weather. The precipitation was deficient in about all sections of the State, while the temperature of the month was considerably above the average, the monthly means ranging from  $2^{\circ}$  to  $4^{\circ}$  above the June normal.

The month opened with several days of cool weather, the temperatures during the night being unseasonably low in some sections, with scattered frosts on the 2d and 3d. The 16th, 17th and 18th were also cool, with temperatures from  $2^{\circ}$  to  $5^{\circ}$  below the seasonal average. But through the rest of the month the temperatures were high. Particularly warm spells prevailed from the 7th to the 10th inclusive, and 19th to 21st inclusive, with temperatures ranging to  $90^{\circ}$  or above in nearly all sections.

There were no general rains during the month, the precipitation being the result of local showers and storms, irregularly distributed. By the middle of the month the rain was much needed, reports from many sections stating that the ground was very dry, and the drought was becoming serious. The continuous sunshine, with fresh to strong winds, during the remainder of the month greatly increased the intensity of the drought, and at the close vegetation and other interests were suffering from need of copious rains. The rainfall of the month was from 40 to 60 per cent below the normal for June.

In the circular to correspondents, returnable June 25, the following questions were asked:—

1. What insects are proving injurious in your locality?
2. How is Indian corn looking, and what is the acreage as compared with previous years?

3. Has haying begun, and what is the prospect for the crop?

4. How does the acreage of early potatoes compare with previous years, and what is the promise for the crop?

5. How do early market-garden crops compare in yield and price with former years, and what is the prospect for those not yet harvested?

6. How do the quantity and price of dairy products and the supply and price of dairy cows compare with former years?

7. What is the condition of pasturage in your locality?

8. What is the outlook for such fruits and berries as are grown for market, naming them?

Returns were received from 122 correspondents, and from these the following summary has been compiled:—

#### INSECTS.

Insects appear to be rather less injurious than usual this season, judging from the returns. All the common sorts are reported as present, but not in more than ordinary numbers, and there are many correspondents who say that there is no appreciable insect damage to be noted. The potato bug is, of course, the one most commonly reported, but they do not appear to be as prevalent as in many seasons. Rather more correspondents report the presence of the canker worm than for some years past, but there are no reports of particularly serious damage from this insect. The gypsy moth is reported as increasing in many localities, and is extending over a wider area.

#### INDIAN CORN.

The acreage of Indian corn is reported as considerably increased in the aggregate throughout the State, though there are occasional reports of decreased acreage. The crop was planted rather late, but germinated well as a rule, and suffered less from the hot, dry weather of the greater part of June than most other crops. It has consequently come forward rapidly and is now in good condition, the stand and color generally being excellent. With the recent showers it



should progress very favorably, unless weather conditions are unseasonable in future as to lack of heat and rainfall. A larger proportion of the crop than usual appears to have been put in with a view to harvesting as a grain crop, due in a large measure to the very high prices of grain for the past year.

#### THE HAY CROP.

The wet, cool weather of May gave the grass crop a splendid start and at the opening of the month conditions were very favorable. The weather of June was unusually hot and dry, there being practically no rain in many sections from May 30 to June 24, and the hay crop suffered especially from these conditions. It will generally be light on old fields, where favorable conditions as to moisture are always necessary for a good crop, and on new fields it will hardly attain the weight that it would with suitable conditions. It is rather difficult to predict just what the outcome will be, but a conservative estimate would seem to be that the hay crop in the State will be at least one-fourth below the normal.

#### EARLY POTATOES.

The acreage of early potatoes shows a slight increase over former years, though reports are much more mixed and contradictory than in the case of Indian corn. The crop appears to be in excellent condition, and it is probable that the recent showers came in time to prevent serious damage. It must be borne in mind, however, that showers, even when heavy, have not the permanent beneficial effect of the same amount of moisture in the form of a steady rain, and it is therefore necessary that there should be plentiful and seasonable rains during July if the crop of early potatoes is to fulfill present expectations.

#### EARLY MARKET-GARDEN CROPS.

Early market-garden crops generally gave good yields, in many instances unusually heavy ones, but the prices have been so low that it is doubtful if most market-gardeners can show an average profit for the season to the present date. Peas are reported as just coming into the market in many

instances and as bringing good prices. The asparagus crop appears to have been light as a whole, and prices were hardly up to the average. Later market-garden crops are making a good growth and promise good yields.

#### DAIRY PRODUCTS AND DAIRY COWS.

The flow of milk appears to have been well maintained in spite of the dry weather and shortened pasturage. The price paid for milk in the Boston market is the same as last season, and judging from reports from other sections it is as high in local markets as ever before, and in some instances a slight increase is reported. Butter and butter fat commands about the same prices apparently as in former seasons, in spite of the lower price in the wholesale market. Dairy cows are in fair supply, with good cows commanding very good prices. Some few farmers appear to have sold their cows and withdrawn from the dairy business, but this has hardly affected the market price of new milch cows to any extent.

#### PASTURAGE.

The dry weather of June shortened feed in many pastures, but only those which are situated on dry uplands show serious effects as yet. The showers of the closing days of the month revived feed in most cases, and with seasonable rains in future there should be no trouble from shortness of pasture feed where the pastures are not overstocked.

#### FRUITS AND BERRIES.

An average crop of strawberries was secured and at time of making returns was over with in most sections. Prices held well throughout the season, and where the vines did not winterkill, as they did to more or less extent in some sections, there appears to have been a profitable season for the growers. Blackberries and raspberries did not winterkill to any extent and promise excellent crops now that the drought has been broken, provided that it is not renewed during the next few weeks. Currants generally promise well. Wild berries bloomed well and have come forward

finely. Peaches are reported as promising in a few sections, but the crop is generally a failure, taking the State as a whole. Pears and plums are reported in many sections as not setting well, and will hardly bear out the promise of the bloom. Apples set well and a good crop is promised in most sections, though there are no indications of an unusually heavy one. The "drop" appears to be somewhat increased by the dry weather of June, but should be checked by the recent rains. Cranberries bloomed well and promise a good crop at present, though there are some reports of damage from late frosts.

## NOTES OF CORRESPONDENTS.

(Returned to us June 25.)

## BERKSHIRE COUNTY.

*New Marlborough* (E. W. RHOADES). — Insects have done but little damage up to this time. A full acreage of corn was planted, most of which is in fine shape. Not much haying is done yet, but a good yield is expected. Many potatoes were planted and are growing finely. Not much early market-gardening is done here; early peas plenty and good. There seems to be more dairy products produced than there is market for; prices for cows keep up. Strawberries raised for home use and promise well where well cared for.

*Tyringham* (EDWARD H. SLATER). — Potato bugs are doing some damage. Indian corn is looking fairly well, with acreage fully up to former years. Haying has not begun yet and the recent dry weather has injured the crop. Early potatoes are looking well. Only a few market-garden crops are raised here. About the usual quantity of butter has been made. Pastures are getting very dry. The outlook for berries of all kinds is good.

*Stockbridge* (F. A. PALMER). — No insects are doing damage as yet. Indian corn looks well, with an acreage increased 5 per cent over last year. The prospect is good for an extra hay crop. Early potatoes are doing well and promise a good crop. The price and yield of early market-garden crops is about as usual and all look well. Dairy products are in good supply and at good prices. Pasturage is in extra condition. Very few berries are grown for market, but such as are, are looking well.

*Richmond* (TIMOTHY B. SALMON). — Potato bugs are doing some damage. The acreage of corn is about average and it is looking very well. Haying has begun, with about a medium crop in quantity and quality. Very few potatoes are being raised this year. There is an average yield of early market-garden crops at good prices, and later ones promise to be good. There is about the average quantity of dairy products and prices are good; dairy cows plentiful and prices average. Pasturage is in good condition. Strawberries and raspberries are good crops; some cherries and plums.

*Washington* (E. H. EAMES). — There are very few insects doing damage. Indian corn is looking as well as in previous years, with about the usual acreage. Haying has not begun and there is prospect



of a good crop. Potatoes are about as usual in acreage and look well. Market-garden crops are not raised for market. Dairy products and dairy cows are about the same as in former years as to supply and price. Pastures are in good condition. Fruits and berries are not grown for market in this locality.

*Peru* (F. G. CREAMER). — Potato bugs are doing some damage. Corn is looking well, with about the usual acreage. Haying has not begun, but there is a good crop in prospect, though rain is badly needed. The acreage of potatoes is larger than usual and they look well at present. Butter is higher than a year ago; there is little call for dairy cows. Pastures look finely. Blueberries are looking well and promise a large yield.

*Cheshire* (L. J. NORTHUP). — Potato bugs are the most injurious insect at present. The acreage of Indian corn is about the same as in previous years and it is looking well. Early potatoes show the usual acreage and promise a good yield. Haying has not begun and the prospect for the crop is fairly good. Garden crops do not seem to be quite ready for the market. Dairy products bring a fair price with the usual quantity. Pastures are getting somewhat dry, but will improve. Strawberries are abundant and of fine quality; other fruits not ready for use as yet.

*Savoy* (WILLIS W. BURNETT). — Potato beetles are as usual quite troublesome. Corn is late and the acreage is less than in previous years. Haying has not yet begun; crop good on well-fertilized fields and light on old ones. The acreage of early potatoes is above that of previous years; they are later than usual and looking finely. But little market-gardening is done and the gardens are unusually backward. Dairy products are fully average both in quantity and price; good dairy cows are high in price. Pasturage is in fairly good condition, but will improve with the recent showers. Not much is done with fruits and berries in this locality.

*Williamstown* (S. A. HICKOX). — No insects are doing damage. Corn shows a poor stand caused by failure to germinate; acreage normal. Haying has begun and a fair crop is promised. There is the usual acreage of early potatoes and they are in fine condition. There is a normal supply of dairy products with prices up to former years. Pasturage is in fair condition. Strawberries are a good crop and raspberries promise well.

#### FRANKLIN COUNTY.

*Monroe* (DAVID H. SHERMAN). — A very few potato bugs are doing damage. But little corn has been planted, but it is of good color and looks well. Haying has not begun; dry weather affected the crop severely and old mowings will be light. There is an average acreage of early potatoes and they are looking well, though many fields are late. But few market-garden crops raised here. Dairy products bring lower prices than last year; supply and price of dairy cows average.

Fruits and berries are not grown for market; wild strawberries plenty and early.

*Rowe* (N. E. ADAMS). — Cattle flies are very plenty, other insects scarce. Owing to the dry spell for the past three weeks Indian corn is very backward. Haying has begun and there is a very light crop, owing to drought. There is a good acreage of potatoes and they are in very good condition. Quantity and price of dairy products and dairy cows about as in former years. Pasturage is in good condition. There are no berries grown for market; wild strawberries were killed by frost. We have been having a severe drought, which was broken by rain on the 24th.

*Bernardston* (R. H. CUSHMAN). — Black flies and potato bugs are on potatoes as usual and large flies are numerous and tormenting stock. There is an average acreage of corn, but the stand is uneven and condition is not average. The condition of the hay crop is very uneven and there will be less than an average crop. More potatoes have been planted than usual, but conditions have not been favorable for growth. The price for cream is somewhat higher than last season and the best butter commands fair prices. Pastures are short. Apples will be a very light crop. The drought through June has damaged mowings, pastures and all growing crops, especially on light land; very good showers the eve of June 24.

*Gill* (F. F. STOUGHTON). — There is not much trouble from insects. Much Indian corn was planted late and the crop is backward. Haying is just beginning; the crop looked extra good early in the month, but the dry weather has prevented good growth. Cream sells well and cows sold high in the spring; not many sales now. Pasturage is in good condition. Strawberries and blackberries promise good crops. There was plenty of rain up to May 30, but it has been dry since then; rain the 24th.

*Ashfield* (ALBERT HOWES). — Not many insects have appeared. Indian corn is looking well, with a largely increased acreage. The hay crop is lighter than was expected and haying has commenced. There is an average acreage of early potatoes with a fair prospect for the crop. No market-garden crops are raised here. Cows are doing well and the price of butter and milk is above average; good cows scarce and high. Pasturage is in better than average condition. The outlook for small fruits and berries is good, but they are little grown for market.

*Whately* (C. L. CRAFTS). — Wire worms and cut worms are doing some damage. Corn is looking well, with about the usual acreage. A few have begun haying and there is prospect of a large crop. Potatoes show about the usual acreage and are well advanced. The dry weather has held market-garden crops back, but prices are good, and later crops look well. Butter and milk is low in price, but cows cost about the same as usual. Pastures are in good condition. Very few fruits are grown for market, except apples, and they promise a fair crop.

*Sunderland* (GEO. P. SMITH). — Potato bugs are doing some damage. There is the usual acreage of corn and the stand and growth of the crop is good. Haying has just begun and the crop is about three-fourths of a full crop. Early potatoes are not much grown for market but promise well. Prices of early market-garden crops are about as usual and the prospects favorable. The supply and price of good cows has not changed, but dairy products are a little lower. Pastures are becoming short because of drought. Strawberries are plenty, but not much grown.

*Erving* (CHAS. F. CLARK). — Potato bugs are the worst insect at present. Indian corn is looking well, with about the usual acreage. Haying has begun, with about an average crop. The acreage of early potatoes is about the same as usual, and they promise a fair crop. Pastures are in good condition. There will not be a very large crop of apples; not many berries are grown for market.

*New Salem* (DANIEL BALLARD). — Rose bugs and potato bugs are plenty. Indian corn is looking well, with about the usual acreage. Haying has commenced, but the June drought has cut down the crop, especially on dry uplands. There is the usual acreage of early potatoes, but they are in need of rain. Not much is done with market-garden crops. There is no marked change in the quantity and price of dairy products. The start of feed in pastures was excellent, but they are failing at the present time. Strawberries are plenty, though diminished by dry weather; heavy bloom on blackberries. The drought was broken by a heavy shower on June 24.

#### HAMPSHIRE COUNTY.

*Prescott* (W. F. WENDERMUTH). — Potato bugs are our most injurious insect. There is the usual acreage of Indian corn and it is looking well, but has suffered from dry weather. Haying has not yet begun and the crop will be light, owing to dry weather. Potatoes are not grown for the early market. Market-garden crops are not grown here. Cows and dairy products are about as last year in quantity and price. Pastures are getting short on account of dry weather. Apples are the only fruit grown for market to any extent and did not set well, and have also dropped badly. Showers on the 24th gave some relief, but more rain is badly needed.

*Enfield* (D. O. CHICKERING). — Potato bugs are doing the most damage of any insect. Indian corn is quite backward but is doing well; acreage less than usual. A few farmers have commenced haying and the crop will be light. The acreage of early potatoes is about as usual and the prospect for the crop is poor. The quantity of dairy cows and dairy products does not vary much from former years. Pasturage is very short on account of dry weather. Apples promise a heavy yield; strawberries a very light crop and are about gone by.

*Belchertown* (H. C. WEST). — There are no insects which are espe-



cially troublesome. Indian corn is looking fairly well, with a larger acreage than usual. Haying has just begun and a fair average crop is in prospect. Potatoes are ten per cent above last year in acreage and are looking well. Very little is done with market-garden crops in this vicinity. Dairy products are well up in price, but cows are low, owing to milk troubles. Pasturage is short, owing to the long dry time, but the rains of the last two days will help. The sooner the eight to fifteen cow farmer drops his milk business, to return to butter, calves and pigs the sooner his temper, his farm and his finances will take on improved conditions.

*Hadley* (L. W. WEST). — Potato bugs are not as numerous as usual. Corn is looking well and there is a slight increase in acreage. A little hay has been cut and this week's rains insure a good crop. There is about the usual acreage of early potatoes and they are in bloom. There was a full average yield of early market-garden crops and there is good prospect for the others. The quantity of dairy products is below the average and prices are about normal; price of cows below former years. Pastures are in good condition. There is a good outlook for berries; peaches and plums will be scarce.

*South Hadley* (W. F. PERSON). — Potato bugs and rose bugs are doing some damage. Corn looks well and the acreage is about the same as in former years. Haying has commenced and the crop will be a good one. The acreage of early potatoes compares favorably with other years and the crop looks well. Garden crops look well, with good prices and good prospects for later crops. Dairy products are not up to the average of former years and a good many farmers have sold their cows. Pasturage is in good condition. Strawberries are a good crop and all other berries bid fair to yield well.

*Easthampton* (WILLIAM C. CLAPP). — Potato bugs, squash bugs, rose bugs and cut worms are doing damage. Indian corn is looking well and shows a full acreage. Haying has begun and there will be an average crop. Fully as many early potatoes as usual were put in and they are looking well. Early market-garden crops are fully up to the normal. Dairy products are about the same as last year in quantity and price. Pastures are looking well, but the rains will help high lands. If we have plenty of rain there will be a full fruit crop.

*Westhampton* (LEVI BURT). — Potato bugs are about ten days earlier than usual. Corn is looking finely, with about an average acreage. Haying has begun, with every prospect of a good crop, above the average of the last five years. Early potatoes are looking well, with the usual acreage. The quantity and supply of dairy products is average; price of butter fat a cent more per pound than last year. Pasturage is very poor when at its best with us. Strawberries are a very good crop. The hay crop looks thin on old meadows, as usual.

*Williamsburg* (F. C. RICHARDS). — Potato bugs are the principal



insect doing damage. The acreage of Indian corn is a little larger than usual and it is looking well. Haying has begun and there will be a heavy yield on well fertilized fields. The acreage of potatoes is about as usual and the crop is looking well. Dairy products are higher than usual at this season of the year and the supply is normal; good dairy cows are scarce and high. Pasturage still is good, but beginning to feel the drought. Apples are looking well; peaches a heavy crop and in prime condition; pears about a two-thirds crop of that indicated by the bloom; strawberries a fair crop, but suffering badly from drought.

*Middlefield* (J. T. BRYAN). — There is very little damage from insects. Corn is looking well with the usual acreage. Haying has just begun, with the prospect of more than an average crop. Potatoes look well and with a strong growth; acreage about average. Very little market-gardening is done here. The price of dairy products holds up well and there is a good demand for cows at strong prices. Pasturage is in excellent condition. There promises to be an average yield of fruits and berries.

#### HAMPDEN COUNTY.

*Blandford* (EXOS W. BOISE). — Tent caterpillars are doing some damage. There is a full average acreage of corn and it is looking finely. Very little hay has been cut as yet; grass extra good on rich fields, but poor on old fields. Potatoes are looking well, with the usual acreage. Early garden crops promise well. Dairy products command good prices; cows are scarce and good ones bring high prices. Pasturage is generally in good condition. Strawberries are an extra crop; apples appear to have set well and a full crop is promised; wild berries promise well.

*Russell* (E. D. PARKS). — Potato bugs are the worst insect at present. There is about the usual acreage of Indian corn and it is looking nicely. Haying has begun and the prospect is for a good crop, fully up to the average. There is about the usual acreage of potatoes and they are looking well. Not much is done here with market-garden crops. Dairy products are fully up to the average in quantity and price and good cows are scarce and high. Pastures have been quite dry, but recent showers have improved them. Berries of all kinds never looked better.

*Southwick* (L. A. FOWLER). — Potato bugs, rose bugs and cut worms are doing some damage. Indian corn is looking very well and there is a slight increase in acreage. Haying has scarcely begun and there is promise of a good crop. Quantity of dairy products about the same as usual, with a small increase in price; cows nearly average in supply and price. Pasturage is in extra good condition. The acreage of tobacco is a little larger than usual and the crop is in excellent condition.

*West Springfield* (N. T. SMITH). — There is no serious injury from insects. Indian corn is unusually forward and promising, with a slight

increase in acreage. Haying has begun to a limited extent and there is a full average crop in prospect. There is a slight increase in the acreage of potatoes and the crop is promising and coming forward very rapidly. Market-garden crops are a full average in yield and price with good prospects. The quantity and price of dairy products is about average, also that of dairy cows. Pasturage has suffered from heat and drought which has been relieved by recent showers. Strawberries are a fair crop and raspberries and blackberries are promising. The season has been one of unusually rapid plant growth and freedom from insect depredations and fungous diseases.

*Chicopee* (E. L. SHAW). — Potato bugs excepted, insects do not seem to be doing much damage. Corn is doing very well except on dry uplands. Haying has begun and the crop seems to be good. The acreage of early potatoes is smaller than usual, but the crop seems to be good. Milk has been plenty, with the price a little off; cows plenty and not many sales. Pastures are in good condition. Strawberries are a fair crop; blackberries and grapes promise good yields.

*Hampden* (JOHN N. ISHAM). — There is not much damage from insects. Indian corn is growing rapidly, with a little larger acreage than in previous years. Haying has just begun with prospect of a good average crop. There is the usual acreage of early potatoes, and they promise fairly well. Garden crops show good yields, with satisfactory prices; later crops promising. Quantity of dairy products not above average, but prices higher; supply of dairy cows ample with full prices. Pastures are good although the dry weather has checked growth somewhat. Apples and pears are looking well; strawberries were a short crop; raspberries and blackberries promising. The recent rains have helped all crops.

*Wilbraham* (H. M. BLISS). — Corn is looking fairly well, with the acreage ten per cent below the normal. Haying has begun, with about a three-fourths crop. The acreage of early potatoes is up to the normal and the crop looks fairly well. Market-garden crops are about up to the usual average. Dairy products and dairy cows are up to the normal in supply and price. Pastures are in fairly good condition. Fruit promises nearly a full yield, though late frosts injured small fruits. There has been a severe drought with a good shower on the 24th.

*Monson* (F. D. ROGERS). — No insects are doing any appreciable damage. Indian corn is late, but of good color and growing fast. Haying has begun, grass being about ten days earlier than usual. There is about the usual acreage of early potatoes, but the crop is rather backward. Dairy products are up to a good average in quantity and price; new milch cows scarce and high. Dry weather is cutting pasturage short. Strawberries have been a good crop; currants, raspberries and blackberries are very promising.

*Holland* (FRANCIS WIGHT). — Potato bugs are doing some damage.

Indian corn is looking fairly well, with about a normal acreage. Haying has begun in some instances, and there will not be more than a normal crop. The acreage of potatoes is about the same as in other years and they are looking well now. Not much is done in market-gardening here. Pastures are in fairly good condition. The outlook for fruits and berries is very good.

#### WORCESTER COUNTY.

*Warren* (W. E. PATRICK). — Potato bugs, spittle insects and cut worms are doing damage. Indian corn is making a good growth, with about the usual acreage. Haying has begun and the prospect is good for a full average crop. The acreage of potatoes is above the average and the vines are looking finely. The quantity of dairy products is somewhat below the average, with prices for milk low; cows must be first class to bring good prices. Pasturage has been very good but is feeling the effects of dry weather. Strawberries are a full crop, currants good, prospect for a large yield of peaches and pears.

*Brookfield* (FRANK E. PROUTY). — There are no insects doing damage except the potato beetle. Indian corn is looking well, with the acreage one-fourth more than in previous years. Haying has begun and the prospect is good for a large crop. The acreage of early potatoes is about the same as usual and the crop looks well. Yield and price of early market-garden crops about as in former years and prospect good for later ones. Quantity and price of dairy products about average. Pastures are in good condition. The outlook is good for fruits and berries.

*New Braintree* (CHARLES D. SAGE). — Potato bugs are doing some damage. Indian corn is doing well and more was planted than usual. Haying has begun; old fields very light. More early potatoes than usual were planted and they are looking finely. Market-garden crops are not grown here. The quantity of dairy products is fair, but prices are lower; cows bring fair prices. Pasturage is in very good condition considering the dry June. Apples are about the only fruit grown, and they promise only a light crop.

*Barre* (JOHN L. SMITH). — No insects are doing damage. The prospect is very good for the corn crop. Very little hay has been cut as yet. Potatoes are little raised for market. Early market-garden crops are not much grown. The quantity and price of dairy products is about the same as last year, but cows are not as high. Pastures have been very good, but are beginning to dry up: the fine rain on the 24th helped them. The outlook is good for fruits and berries.

*Dana* (LYMAN RANDALL). — Rose bugs and potato bugs are doing some damage. Corn is looking finely, with a much larger acreage than usual. Haying has begun with prospects of a fair crop. There is about the usual acreage of potatoes and the crop promises fairly well. Not many market-garden crops have been harvested, but they are



looking promising. The quantity and price of dairy products are about the same as last year, but dairy cows are lower. Pasturage is good except on some dry pastures, which have suffered from lack of rain. Strawberries have been cut short by the drought; currants are promising.

*Royalston* (C. A. STIMSON). — No insects are doing any damage. Corn looks fairly well, but is suffering from drought. There will be but a light crop of hay. Very few early potatoes were planted, but they promise well. No early market-garden crops have been harvested as yet, but prices promise to be high. Quantity of dairy products above average, price about the same as last year; cows high. Pastures are drying up. There will be a full crop of all berries; apples 80 per cent; pears 75 per cent.

*Ashburnham* (E. D. GIBSON). — There is very little trouble so far from insects. Indian corn is about normal in condition and the acreage is increased. Very little haying has been done and the crop will be good if we have an abundance of rain at once. The acreage of early potatoes is about as usual, too early to tell anything about the crop. Prices for dairy products are as good as last year, and the supply of cows is equal to the demand; prices from forty to sixty dollars. Pasturage has been fine, but begins to feel the drought seriously. Fruits and berries are not grown for market; blueberries promise a wonderful crop.

*Gardner* (W. E. KNIGHT). — Potato bugs and cabbage maggots are doing some damage. Corn shows good color, but is growing slowly. The dry weather has forced haying before the crop is grown and the yield will be very short. Potatoes are little grown for market. Early market-garden crops are not grown for market. The quantity of dairy products is below normal and prices are low; cows sell slowly as few are buying. Pastures are all dried up. Apples look well; currants are good, but other small fruits are feeling the dry weather.

*Hubbardston* (CHAS. C. COLBY). — There has been very little trouble from insects of any kind. About the usual amount of corn was planted, but the crop is backward, owing to drought. Haying begins here about July 1 and the crop will not be up to the average. About one-third more potatoes were planted this year than usual and are now doing well. Very little market-gardening is done here. Prices of dairy products for the past year have been such as to hardly pay expenses, and a number of our farmers have sold their cows at fair prices. Pasturage is in good condition. The prospect is for a good crop of apples, our only market fruit.

*Princeton* (A. O. TYLER). — Squash bugs and cut worms are doing some damage. Indian corn is looking finely, with a slightly increased acreage. Haying has begun and the prospect is that the crop will be light. There is about the usual acreage of early potatoes and they promise well. Early market-garden crops are not raised here. Dairy



products are a little lower in price than formerly; dairy cows about the same. Pasturage is in fair condition, but is somewhat affected by the dry weather. Fruits and berries are not grown for market and the general outlook is light.

*Sterling* (HENRY S. SAWYER). — Potato bugs are doing some damage. Corn is looking well for the time of year, with about an average acreage. Haying has begun, and the want of rain has shortened the crop materially. There is about the usual acreage of potatoes and the crop promises well. Asparagus was a light crop; other market-garden crops looking well. Milk brings 29 cents per can and butter 32 cents per pound, no over supply of either; cows forty to seventy-five dollars. The dry weather has begun to shorten the feed in pastures in some localities. Strawberries are not very plenty; raspberries and blackberries promise well; also apples and pears.

*Northborough* (JOHN K. MILLS). — Rose bugs and squash bugs are doing some damage. Corn is looking well and the acreage is larger than last year. But very little haying has been done as yet. The acreage of early potatoes is larger than last year and the crop is looking nicely. Early market-garden crops have been good, but prices have been lower than last year. The price of milk is the same as last year; very little change in the price of cows. Pastures are not holding out well, owing to the dry weather. There is a full crop of strawberries, and raspberries, currants, grapes, pears, peaches and blackberries all promise well.

*Leicester* (H. H. KINGSBURY). — Potato bugs are quite numerous. The month has been favorable to the growth of corn and it is in fine condition. Haying has begun and the prospect is good for a large crop. The acreage of potatoes is about the same as usual and they look very thrifty. Garden crops were checked in growth in May, but are now growing fast. The price and quantity of dairy products does not vary much from last year. Pasturage is in excellent condition, owing to the recent copious showers. Fruits and berries of all kinds, both wild and cultivated, from present appearances will be very abundant.

*Blackstone* (O. F. FULLER). — Potato bugs, elm beetles and cut worms did but little damage this year. Indian corn looks well, and the acreage is three times as great as last year. Haying has begun and a good crop is promised. The acreage of early potatoes is about as usual. Market-garden crops have brought about the usual prices. Milk retails for seven cents per quart; butter 32 cents per pound, and cows are high. Pastures are in good condition. The outlook for fruits is good. The heavy rain and wind storm of June 23 lodged the heavy standing grass badly.

#### MIDDLESEX COUNTY.

*Sherborn* (N. B. DOUGLAS). — No insects are especially troublesome. Indian corn looks well, with the usual acreage. Considerable hay has been cut and the prospect for the crop is good. There is a large acreage

of potatoes and they are looking well. The dairy business is not satisfactory from the producers' standpoint. Pasturage is getting short.

*Hopkinton* (W. V. THOMPSON). — Potato bugs are not very plenty, but spittle bugs are doing a good deal of damage to grass. Corn looks well and there was a full acreage planted. Haying has just begun, with the prospect of a little more than an average crop. Early potatoes look finely now and every one seems to have put in more than usual. There is not much market-gardening done in this vicinity. There is about the usual condition as regards dairy products and dairy cows. Pastures hereabouts are dry, but the recent showers will freshen them. Strawberries are a better crop than usual, with prices better than common. The season is a little more forward than usual for everything.

*Framingham* (J. S. WILLIAMS). — Onion maggots, cut worms and potato bugs are doing some damage. All corn is looking well, with a full acreage. A larger percentage of the hay crop will be secured before the 4th than usual; old fields light, others heavy. The acreage of potatoes is up to the average of former years and the vines are looking well. The early market-garden crops have sold low, later crops are looking well, but low prices are expected. Milk production steady, average prices realized; good cows are selling well. As a general thing pastures are in good condition notwithstanding light rainfall. Fruits set quite heavy and promise very well.

*Maynard* (L. H. MAYNARD). — Gypsy moth caterpillars are doing some damage and seem to be increasing; potato bugs and cut worms also doing damage. Indian corn is backward; acreage about as formerly. A little haying has been done and the crop will be very short on upland. The acreage of potatoes is about as usual; prospect good on early planted fields, later ones suffering from drought. Market-garden crops are suffering from dry weather; prices about as formerly. Dairy products and dairy cows are about as usual. Pasturage is fairly good, but is showing effects of dry weather. Strawberries are in full supply and of good quality; currants, blackberries and raspberries promise full crops; apples promise an average crop; pears and peaches will be short.

*Dunstable* (A. J. GILSON). — At the present time the potato bug and the rose bug are the most injurious insects. Indian corn is in good condition with about the usual acreage. Haying has begun and the prospect is that the crop will be much lighter than was expected. Early potatoes are raised mainly for home use and promise well. Very little is done in the line of market-gardening in this locality. Dairy products are short and the price of milk too low for the cost of making; good dairy cows scarce and high. The dry weather has been pretty severe on the pasturage. There promises to be a medium crop of small fruits; too early to predict on apples.

*Billerica* (GEO. P. GREENWOOD). — Brown-tail and gypsy moth caterpillars are doing damage. Corn is looking well, but there is little

field corn raised here. Haying has begun and the crop promises to be good, though somewhat injured by drought. The acreage of early potatoes is about the same as usual and they are looking fairly well. The yield of early market-garden crops is normal and the price has averaged fairly well. There is rather less milk raised than formerly and prices are not advancing with the cost of production; good cows high. Pastures are suffering from drought. With the exception of strawberries, few berries are raised for market; strawberries winter-killed badly.

*Tewksbury* (G. E. CROSBY). — Tent caterpillars are doing some damage. No indian corn is raised here, but sweet corn is doing fairly well. Haying has begun and the crop will be very light on old land. Acreage of early potatoes about as in former years and the vines are looking well. Early market-garden crops are below the average in yield and price. Dairy products bring slightly higher prices than formerly; cows possibly a little lower. Pasturage is in poor condition and rain very much needed. Peaches promise well; also apples, where the trees have been properly cared for; blackberries and strawberries light crops for want of rain.

*Concord* (WM. H. HUNT). — There is nothing new in the insect line, about the same as usual. Corn is looking well and the acreage is about the same as usual. Very little hay has been cut as yet and the crop promises to be an average one. Early potatoes look well and there is promise of a good crop. A fair yield of asparagus with fair prices; strawberries a large yield with low prices. The price of milk is about the same as last year, but it is higher than it was some years ago. Pasturage has suffered from the dry weather. Apples and pears set pretty well and promise average crops.

*Lincoln* (C. S. WHEELER). — Gypsy moth caterpillars are doing damage. Indian corn looks fairly well, with the acreage about as last year. Haying has begun and the crop is not as good as last year. There is an average acreage of early potatoes and a good crop is promised if we have rain. The yield of early market-garden crops has been good and prices average. Prices for dairy products are about as last year; good cows scarce and high. Pastures are in fair condition and would be good if it were not so dry. Strawberries have looked well, but dry weather is beginning to affect them; blackberries look well; other berries average; early apples have not proved as good as the bloom promised, and much of the fruit that did set is dropping off.

*Stoneham* (J. E. WILEY). — Currant worms, and gypsy and brown-tail moth caterpillars are doing some damage. Haying has begun and the prospect for the crop is good. There is the usual acreage of early potatoes and a good crop is promised. The yield of early market-garden crops has been good, but prices have been low. Pasturage is in good condition. Pears and currants are good crops; strawberries good, where not too dry.



*Arlington* (W. W. RAWSON). — Haying has begun and the crop will only be a light one. Early market-garden crops have suffered from drought and prices have been low. Later crops promise well with seasonable rains. The season is fully a week earlier than last year.

*Weston* (HENRY L. BROWN). — Gypsy moths are doing some damage. I have not seen a field of Indian corn in town. Haying has begun and new fields are giving a good crop, while old fields are light. There is about the usual acreage of early potatoes and they are looking well. Market-garden crops have given average yields, but prices have been low for most crops. Quantity and price of dairy products the same as last year. Pasturage has been good, but is getting dry. Not much is done in growing small fruits and berries.

## ESSEX COUNTY.

*Haverhill* (EBEN WEBSTER). — Brown-tail moths, elm leaf beetles, potato bugs and cucumber and squash bugs are doing damage. Indian corn has been injured by the dry weather and the acreage is rather less than usual. Haying has begun and the crop is less than usual owing to drought. Potatoes are looking well. Yield and price of market-garden crops higher than usual. Dairy cows are rather lower in price than in former years; price of dairy products higher. Cherries and currants are plenty. We have had a severe drought that has hurt fruits and vegetables considerably.

*Groveland* (A. S. LONGFELLOW). — There is some damage from gypsy moths, potato bugs and cut worms. Corn is very forward and the acreage is about as usual. Haying has begun with a light crop. The acreage of potatoes is somewhat increased and they promise well, but need rain. There have been good yields of early market-garden crops but prices have been low. Pastures are sadly in need of rain. There has been no material change in dairy products from last year, but prices are better than a few years ago. The outlook for small fruits is poor, owing to the drought.

*North Andover* (PETER HOLT). — Gypsy and brown-tail moth caterpillars are doing some damage. Corn looks well with about the usual acreage. Haying is fully two weeks earlier than last year and the crop is light. The acreage of potatoes is increased and the crop looks well, many fields being in blossom. All market-garden crops look fairly well and all bring good prices. Dairy products are lower than last year and cows are lower. Feed in pastures has been good up to the present time, but rain is now needed. Strawberries are not a large crop, but bring good prices; raspberries are a failure and blackberries not much better; apples not as plenty as the bloom promised.

*Newbury* (G. W. ADAMS). — Potato bugs are present as usual. Indian corn is looking poorly as the drought has prevented germination in many cases. A little hay has been cut to save it and the crop will be small. There is about an average acreage of potatoes and they



are doing better than most crops. Prices for market-garden crops are fair; where irrigation is possible conditions are good. The supply of dairy products is lessening from year to year, but is sufficient; prices fairly sustained. The condition of pasturage is better than could be expected. Fruits are suffering badly from drought and apples are dropping.

*Rowley* (D. H. O'BRIEN). — Canker worms, gypsy and brown-tail moths and striped squash bugs are doing damage. Corn is looking well and the acreage is above the average. Haying has begun and the prospect is that there will be less than a normal crop. The acreage of early potatoes is about the same as in former years and a good crop is promised. The yield of market-garden crops is about normal, but prices have been low; prospect for late crops good. Quantity of dairy products the same as usual and prices are a little higher; cows average the same. Pastures are in fair condition. Strawberries are good crop; apples medium. Gypsy moths are increasing very noticeably.

*Topsfield* (B. P. PIKE). — Canker worms are doing some damage. Very little Indian corn is raised here, but sweet corn and silo corn is looking fairly well. Haying has begun and the crop will be very light. Not as many potatoes will be harvested as in former years, owing to drought. Prices have been about as usual for early market-garden crops, but they have suffered from drought. Cows are about the same as usual in price; milk five cents per can higher. Pastures are drying up. Strawberries are drying up; other berries look well.

## NORFOLK COUNTY.

*Canton* (EDWIN V. KINSLEY). — Indian corn is looking very well, with about the usual acreage planted. Haying has been in progress for about two weeks and the crop is a little lighter than usual. All potatoes look extremely well and the acreage is much above the normal. Early market-garden crops have been injured by late frosts in some places and prices average fair. Milk is in demand at prices in advance of recent years, thirty-eight to forty cents per can at the farm; good dairy cows high in price. Pastures are growing very dry in consequence of hot and dry weather for the past three weeks. All fruits and berries promise good crops; strawberries somewhat injured by drought.

*Walpole* (EDWARD L. SHEPARD). — Potato bugs and rose bugs are doing damage. Corn looks very well with the same acreage as usual. Haying has begun, with about 80 per cent of a normal crop. Early potatoes are looking well, with about the usual acreage. There is an average yield of early market-garden crops and prices are about as last year. The price of dairy products is the same as last year; cows scarce and higher in price. Pastures are about in normal condition. Strawberries are a fair crop and blackberries are looking well.

*Millis* (E. F. RICHARDSON). — Potato bugs are doing some damage.

Indian corn is in fair condition, but is principally raised for the silo. Not much haying has been done as yet and there will be a fair crop. There is the usual acreage of early potatoes and they are looking well. Prices for early market-garden crops have been low with good yields. Dairy products are a trifle higher than formerly. Pastures are now rather dry.

*Franklin* (C. M. ALLEN). — Potato bugs are doing some damage. Indian corn is looking well, and more than usual was planted. Haying has begun and there will not be more than an average crop. The acreage of early potatoes is not more than last year, and the crop will be light unless we have more than average rains. Early market-garden crops are normal in yield and price. There is about an average supply of dairy products, but they cost more to produce than formerly. Pasturage is in average condition. Strawberries were a heavy crop; blackberries promise a good crop; all other fruits more than average. The season is earlier than usual.

*Bellingham* (J. J. O'SULLIVAN). — Potato bugs are doing some damage. Indian corn is looking well and there is about the usual acreage. Haying has begun and there will be a fair crop. More than the usual acreage of early potatoes has been planted and they promise fairly well. Early market-garden crops were average in yield and price and later ones promise well. Quantity of dairy products the same as usual and prices higher; dairy cows in good supply at high prices. Pasturage is in fair condition, but needs rain. Strawberries and blackberries are fair crops.

#### BRISTOL COUNTY.

*Mansfield* (WM. C. WINTER). — Potato bugs, rose bugs, currant worms and curculios are doing some damage. Corn is generally looking well, with acreage about the same as usual. The acreage of early potatoes is about as in previous years and the crop is generally promising. Early market-garden crops have been about normal in yield and price. Milk is higher in price than formerly, otherwise little change in dairy products. Pasturage has been good but is now suffering from drought. Strawberries are plenty and low in price; pears a heavy crop; apples fair; raspberries and blackberries look well; plums light; peaches fair.

*Attleborough* (ISAAC ALGER). — Potato bugs are doing some damage. Corn never looked better than at present and the acreage is much larger than usual. Haying has hardly commenced and there is an average crop. There is about the usual acreage of early potatoes and the crop is in good condition. All market-garden crops are looking well. There is not much change in the quantity and price of dairy products. Pasturage is in good condition. Apples and pears will be small crops. Strawberries are nearly all picked and were a moderate crop.

*Swansea* (F. G. ARNOLD). — Canker worms are doing some damage. Indian corn looks well, and the acreage is a little above the normal. Haying has begun, with the prospect of a light crop. There is about the usual acreage of early potatoes and they are looking well. Early green stuff gave a heavy yield and brought low prices; cabbages just coming onto the market and prices good. The quantity of milk is about as last year and prices are the same; cows scarce and high. Pasturage was never in better condition. Strawberries have been a good crop; peaches promise well; pears, plums and apples few; no raspberries. The weather has been very hot and dry, but three heavy showers within the week have relieved the condition.

*Westport* (ALBERT S. SHERMAN). — Canker worms and potato bugs are doing some damage. Indian corn is in good condition, with an increased acreage, as farmers have learned that the fodder saves hay and the grain saves dollars. Haying has begun with the prospect of a fair crop, but not as good as last year. The acreage of early potatoes is about as in former years and a good crop is promised. Very little is done with early market-garden crops. Good cows are always in demand and bring good prices. Pastures are in fairly good condition, as we have had rain enough to keep the grass green. Strawberries have been good; apples and pears promise well; peach trees nearly all dead. Farmers are planting turnips and late cabbage, and they will germinate well with the recent rains.

*Acushnet* (M. S. DOUGLAS). — Potato bugs are doing some damage and a small green worm is damaging raspberries badly. Indian corn is looking extra well, with a normal acreage. Haying has begun with two-thirds of a normal crop. Perhaps there has been a fifth increase in the acreage of potatoes and they never looked better. Early market-garden crops are below normal in yield, but bring fairly good prices. Milk is higher than formerly; supply and price of cows about normal. Pasturage is rather short on high land. Strawberries rather a short crop; raspberries good where sprayed; big crop of huckleberries and blackberries; fair crop of apples and pears, though apples have dropped badly. Peas matured early and prices are high.

#### PLYMOUTH COUNTY.

*Norwell* (HENRY A. TURNER). — Potato bugs and currant worms are doing some damage. Indian corn is little raised in this section. Haying has begun, with about a normal crop. There is about the usual acreage of early potatoes and the outlook is good for the crop. Early market-garden crops have been good and the prospect is good for those not harvested. The quantity and price of dairy products and dairy cows is about the same as last year. Pasturage is in very good condition, although rain is needed. Strawberries are a good crop; currants are looking well; pears and peaches have set well.

*Hanson* (FLAVEL S. THOMAS, M.D.). — Cut worms and potato bugs



are doing some damage. Indian corn is looking well and there is an average acreage. Haying is about half completed. Early potatoes are in good condition and there is the usual acreage. Dry weather has decreased the yield of early market-garden crops. Dairy products and cows are average in supply and price. The weather has been too dry for pasturage to do well.

*Bridgewater* (R. CASS). — Cut worms, black and striped squash bugs, and rose bugs are doing damage. Corn is small, but of good color; acreage about as usual. Haying has begun and the prospect is good for the crop. The acreage of potatoes is about normal with prospect of a very good crop. Yield and price of early market-garden crops a good average and prospects good for later ones. Dairy products are good average, with good cows scarce and prices high. Pasturage is in fairly good condition. A few strawberries are grown for market; also apples and a few pears in a small way.

*Halifax* (Mrs. G. W. HAYWARD). — Potatoes suffer from the beetle, but not as badly as some years. Corn is looking well, more than usual having been planted. Hay is being cut on high land. Potatoes look well, but the acreage of early ones is small. The quantity and price of dairy products is about the same as usual. Pastures are in good condition up to the present time.

*Plympton* (WINTHROP FILLEBROWN). — Potato bugs, cut worms, squash bugs, and gypsy and brown-tail moths are doing damage. The acreage of Indian corn is greatly increased and the crop is looking very well. Haying is two or three weeks earlier than usual and there is less than a two-thirds crop. Early potatoes are looking very nicely and the acreage is about as usual. Early market-garden crops have suffered from drought; prices about normal. Dairy products are about as usual, with prices advanced a little; price of cows increased 20 per cent. Pasturage has been good, but will suffer badly soon without rain. All fruits and berries had a good bloom; fruit has set well. Cranberries suffered badly from late frosts.

*Kingston* (GEORGE L. CHURCHILL). — Potato bugs are doing some damage. Indian corn is looking well, with about the usual acreage. Haying has commenced and there is prospect of a fair crop. The acreage of early potatoes is about as in previous years. There is about the same yield as usual of early market-garden crops with prices normal. Cows are higher in price than last year; also dairy products. Pastures are in good condition. Strawberries and currants are good crops.

*Carver* (J. A. VAUGHAN). — Potato bugs are doing some damage. Corn is looking well and more than usual has been planted. Haying has begun on high land and the crop is light. There is the usual acreage of early potatoes and the crop is looking well. Pasturage is getting dry. Strawberries were not injured by frost when in bloom and on moist land are a good crop. Cranberries on some bogs were injured by late frosts, but an average crop may be expected.



*Rochester* (GEO. H. RANDALL). — Potato bugs and currant worms are doing some damage. Indian corn is growing rapidly and there is an average acreage. Haying has begun and is light on light land, but a good average crop will be secured on low lands. The acreage of early potatoes is about average and they are looking well. All garden crops are doing well and bringing satisfactory prices. Pasturage is in fairly good condition at present. There is no material change in relation to dairy products and dairy cows. Strawberries have been a smaller crop than early indications promised; blackberries winter-killed badly; drought has not been as disastrous as was expected.

#### BARNSTABLE COUNTY.

*Bournè* (DAVID D. NYE). — Potato bugs are doing some damage. Indian corn is not very forward on account of dry weather, and very little was planted. Haying has begun and there is about half a crop on an average. The acreage of potatoes is about three-fourths that of last year and the crop is very backward. Prices for early market-garden crops have been favorable, but the yields have been light. Quantity of dairy products not up to last year, owing to drought; prices never higher. Pastures are in rather poor condition, owing to drought. Strawberries in certain sections were almost an entire failure owing to dry weather; apples looking well; cranberries promise an average crop.

*Falmouth* (D. R. WICKS). — Flea beetles are doing some damage. Corn is looking well and the acreage is on the increase. Haying has not begun, and the crop promises better after the recent showers. The acreage of early potatoes is about the same as usual, and they are looking fairly well. Early market-garden crops are about normal in yield, but prices are a little lower than usual. There is no dairying here. Pasturage is improved since the showers. Strawberries are a fair crop; raspberries very promising, also blackberries; currants a fair crop; gooseberries show a bumper crop.

*Barnstable* (JOHN BURSLEY). — Rose bugs, cut worms and wire worms are doing damage. Indian corn is a fair crop where planted early, with a full acreage. Haying has begun and the crop is light. The acreage of early potatoes is an average one and they are looking well. Early market-garden crops are doing very well, and later ones promise fairly well. Quantity of dairy products less than usual, price of milk a trifle higher; cows fewer in number. Pasturage is in fair condition. The strawberry crop was large and is bringing fair prices; cranberries are looking well.

*Dennis* (JOSHUA CROWELL). — Potato bugs are doing some damage. Corn is looking well, with perhaps a 10 per cent increase in acreage. Haying has begun and there is about 75 per cent of a full crop. The acreage of early potatoes is about the same as usual and they promise fairly well. The yield of early market-garden crops is rather below the average and prices are about normal. There is no change in

relation to dairy products and dairy cows. Pastures are about in average condition. Strawberries are a fair crop; cranberries too early to predict. Showers are much needed, have had but one good rain for a month.

*Harwich* (AMBROSE N. DOANE). — Cranberry worms are doing some damage. Corn is looking well with about the usual acreage. There is a fair crop of hay. There is about the usual acreage of early potatoes, but it is too early to predict as to the crop. Early market-garden crops make a favorable showing as to yield and price. Dairy products are much higher than usual. Pasturage is in good condition. Cranberries are our principal fruit crop.

*Eastham* (J. A. CLARK). — Cut worms have been troublesome to asparagus. But little Indian corn has been planted and the crop is about the same as in previous years. The prospect is for a light crop of hay, owing to dry weather. More potatoes have been planted than usual and they look finely now, prospect good with rain. Asparagus is the only market-garden crop harvested and is the lightest for some years, owing to rust and drought. Cows are scarce and command high prices. Pastures need rain badly. The prospect for early apples is good; late ones poor, especially Baldwins.

#### DUKES COUNTY.

*West Tisbury* (GEO. HUNT LUCE). — Potato bugs and squash bugs are doing some damage. Indian corn is backward on account of dry weather; acreage about average. Haying has begun with the prospect of about half a crop. The acreage of early potatoes is average, but they promise poorly, owing to drought. The prospect is poor for market-garden crops. The quantity of dairy products is average and prices are higher than usual; dairy cows scarce and high. Pastures are in good condition. Strawberries are standing the dry weather well, but need more rain to insure a good crop.

#### NANTUCKET COUNTY.

*Nantucket* (H. G. WORTH). — Potato bugs are doing some damage. Indian corn is a little late, with the usual acreage. Haying is well under way, with about two-thirds of a normal crop. Potatoes are looking well, and the acreage is about the same as in former years. Market-garden crops are good with prices fully up to former years. Milk sells at retail at from seven to twelve cents per quart, and good cows are in demand. Pasturage is in good condition, considering the dry weather. Strawberries are a fine crop, with good prospects for the cranberry crop.

## BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

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### SOME SHEEP TOPICS FOR MASSACHUSETTS.

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Ranked among the other States of the Union Massachusetts does not find a place among the leaders as a producer of live stock, either in numbers, value or, in many cases, in quality. Through the development of the natural resources of the State in other lines than animal husbandry live stock has been compelled to find a humbler place. But even with these changes certain kinds of stock should not have fallen to so unimportant a place as they now occupy. Particularly is this true of the sheep industry, with which we are to deal

At one time flocks of sheep were quite common in Massachusetts, wool and mutton forming a large item of the commerce of the State. When the Spanish noblemen, who for so long controlled the fine wool production of the world, were obliged, by the Napoleonic wars, to consent to the breaking up of their flocks, many thousands of them were exported to America. Vermont was the leading State in this importation, owing to the efforts of the minister to Spain at that time, a native of Vermont, but interest in the business speedily spread to other States. The earlier flocks were kept for their wool alone, a highly speculative product. When it ceased to be longer profitable the flocks were disposed of, and since then sheep have not been widely grown in Massachusetts.

Farm values having been materially increased since that time it is thought by many that sheep cannot be made profitable on such high-priced land. However, a study of conditions in England shows that sheep growing is there found profitable on lands much more valuable than those of this State, and feed stuffs are also usually higher in price there than here. The sheep growers of England have the advantage of skill and knowledge, but are successful because they are better managers and more careful feeders than we are. This skill can be easily enough acquired, and some other reason must be sought for the scarcity of sheep.

Many disadvantages must be carefully considered before going into the sheep business, chief among which are the ravages of dogs. The protection afforded by State laws is only partial, the damages received not representing the value of the animals lost to the breeder, particularly where pure-bred sheep are kept. Much harm may be done in a single night by a worthless cur, and often the well-bred dogs kept by sportsmen are equally dangerous and determined in their work. For



protection against this menace the best remedy is a well-trained Scotch collie, or other sheep dog. Fences, well made and high, form a fairly satisfactory barrier, but if these cannot keep out the marauder, a corral, into which the flock is driven every night, is the only protection.

The lack of fences is another drawback on many farms. Low walls, even if well made, form little obstacles to sheep, and woven wire is ordinarily required. This can, if the walls are well laid, be made to go on top, so as to keep the sheep in, and, to quite an extent, the dogs out, by setting posts down the side of the wall and fastening the fencing to these above the top of the wall. On many farms the expense of this sort of fence would be heavy, because there would be division fences between the different fields. Movable hurdles may often be used when desired to pasture the ewes on rye or other green forage, in the "flushing" season, or when the permanent pasture becomes short in feed, and such hurdles are less expensive than permanent fences around all fields.

More losses in the whole country are annually caused by parasites than by dogs, wolves and thieves. The pastures become infected from the droppings of the sheep, and where the surface drainage is poor, or a low pasture receives the drainage of surrounding upland pastures, infection is very probable. Sheep are close grazers and so are more liable to such infection than other kinds of stocks. Drinking water from standing pools in the pasture is another prolific source of infection. The parasites affecting the alimentary canal are those most dreaded by flock masters, among them being the stomach worm, the liver fluke, the hook worms, gids, etc. By rotation of pastures, using upland, well-drained fields, and allowing only running streams to furnish water supply, serious trouble may be prevented.

Another class of parasite is deposited in the nostrils by flies, in the larval form, and gradually works up the nasal passages, and sometimes into the brain cavity, where it begins to grow. Lime given the sheep causes them to sneeze, thus dislodging these larvæ. Holes bored in timbers, with salt deposited in them and the edges smeared with tar, are always used as preventives, the noses of the sheep becoming smeared with tar, the odor of which keeps the fly away from the nostrils.

All these obstacles can be easily overcome if due care is exercised in watching the flock, changing pastures and keeping up fences, — things which are, after all, but a small part of the flock master's work.

There is a great demand for pure meats of any description in the country at present, and New England is situated at a considerable distance from the sources of supply. The supply of sheep is at present quite low, and packers have been obliged to kill stock only half fattened, "just warmed up," as the stock yards' expression is, to fill their orders. The demand for mutton is enormous, and a fact which should be significant to Massachusetts farmers is that the heaviest and most urgent demands come from New England and the Middle Atlantic States.

It would not be wise to attempt to raise sheep in all sections of Massachusetts and it is not likely that an immediate and complete change would be found possible in any case. However, the dairy business is not as profitable in many sections as formerly, owing to the high cost of feed stuffs, which is not met by a corresponding increase in the price received for their products. In the hilly sections of the State, where the pastures are rather poor, considered as a range for other animals, sheep would do best. Here flocks could be established, which would do away with the farmer's dependence upon dairying.



Sheep delight in browsing weeds and undergrowth, and are in their element where cattle and horses cannot live. In a few years' time they would bring these old pastures to the point where good pasture grass could grow, and make them more profitable than ever, particularly if they were given a little grain and clover hay while doing the cleaning up work.

Every farmer who does any general farming should raise a few sheep. Their advantages are easily seen, they do much of the cleaning up work spoken of above, and the wool which an ewe clips will often pay for her keep during the year. They can well be kept for the sole purpose of keeping the meat bill down, as they give a carcass which can be used before it spoils in the summer months, something that no other farm animal does, and the pelts of those so used may be sold to the hide man and bring additional income.

On farms where the owner desires to make sheep a chief industry there are only two principal lines that are profitable, the raising of lambs for the summer market or the production of winter or "hot-house lambs." It is not possible to buy lambs for feeding, native lambs not being available, and the cost on the nearest general market, Buffalo, being so high as to preclude buying them and shipping them to New England to fatten. Necessarily the only profitable meat production with our conditions is where the product is matured at as early an age as possible. The cost of grains is considerable, and the largest gains from a given amount are made when the animal fed is young. We must therefore get our product to market at as early an age as possible. It is not practical to keep sheep in Massachusetts for their wool alone, in fact, it was wool that destroyed the sheep industry in this State in the first place. Wool can be grown to a profit only on the western mountain ranges, where land is cheap, and where there is little competition with other more intensive industries. In choosing a breed for this State it would, however, be well to choose one which would shear as heavily as possible and yet not interfere with its mutton-producing qualities. In other words, a mutton-general-purpose sheep is most desirable.

This brings up the question of what breed is best suited to the New England States in general and Massachusetts in particular. The considerations desired are a mutton sheep which carries a good fleece, both as to staple and quality. The fleece should be made up of wool which is most often called for in the market, so as to insure an easy sale at a profitable price. The quality of the mutton is also a point which merits consideration. If a local market is sought, as is almost necessary, the quality of the meat must be high, the texture fine, fat well distributed, to give juiciness to chops and roasts, and the whole cut tender. Young animals usually give the most tender meat, and various breeds are noted for the flavor of their flesh. The prolificacy of the breeds is another point meriting consideration, as intensive methods must be followed here in all lines. A flock averaging a lamb and a half to a ewe is evidently more valuable than one averaging only a lamb to a ewe. Much depends upon the comparative strength of the lambs in the two cases, but as a rule those breeds which average as high as a lamb and a half per ewe bring forth quite strong and well-growing young. A further requirement is that the breed should be able to pick up a rough living on the hills and be adapted to the climate of the region. With these points in mind a description of a few of the more prominent breeds of mutton sheep will be given.

Mutton sheep will be divided, according to the length of their wool, into two classes, — the long wools and the short, or, as they are more

commonly known, the medium-wooled breeds. All of our mutton breeds came originally from England, noted as the greatest meat-consuming nation in the world, and where the people have a particular liking for mutton, even though noted as beef eaters.

Of the long-wooled breeds the three most important are the Leicester, Lincoln and Cotswold, and of the medium wools the Shropshire, Southdown, Hampshire Down, Oxford and Dorset are the best known and most valuable. The four first named medium wools are known as the "down" breeds, as they originated in the down countries of England, — in Shropshire, Sussex, Oxford and other counties in south-central England.

As a general thing the long-wooled breeds are the larger, and, as is true of most large animals when compared with those of the same species which are smaller in size, are slow in reaching their mature form. Add to this the fact that the quality of their flesh is not of the best, there being a tendency to coarseness in grain, the fibers of the red meat standing out prominently, like the fibers in the shoulder steaks of a beef, as compared with the fibers of the loin cut of the same animal. With this coarse texture there is a tendency to a too uneven distribution of the fat, great soft bunches being likely to appear at the tail head and down at the fore flank, giving weight to the animal but detracting markedly from the value of the carcass. Another characteristic of the long-wooled breeds which might be urged as an objection is that they are not as strongly prolific as the smaller varieties. Bearing these things in mind it will hardly be necessary to discuss their characteristics more in detail, and the principal characteristics of the smaller sheep will follow.

Of these none is so widely known throughout the entire country as the Shropshire. It is a fairly small breed, mature rams averaging 225 pounds and ewes from 150 to 160 pounds, sometimes reaching 175 pounds. It is about the average in size of the middle-wooled breeds, and is a very squarely built and low-set animal, having abundant spread of rib, and carrying a thick covering of flesh on the back, loin and leg, those parts of most value on the carcass. From the back and loin come the chops, while roast leg is furnished from the latter part. A dense, fairly uniform fleece of medium length, averaging from two and one-half to three and one-half inches in length, covers the sheep.

A typical individual of the breed is blocky, low set, with level top and bottom lines, woolled well down to the feet, both in front and behind, with the body well covered. No black wool should show, but the tips of the nose and ears are black in the best specimens. The wool should go well over the face, leaving only the tips of the nose and ears visible, the eyes being scarcely visible in many animals. The ears should have little tufts of fleece scattered about over their upper surface.

This breed is very popular as a general-purpose animal on account of its good size and fine quality of mutton and wool. Its early maturing qualities are first class, and are transmitted in large part to grade offspring. As grazing sheep other breeds have more adaptability, but in New England satisfactory results have been obtained in grazing them. The average percentage of increase among Shropshire flocks is nearly 150, or an average of a lamb and a half per ewe. Not every flock master can secure so high an average, but many have had even better results. It is as common a breed in America as any.

The Southdown is the smallest of the "down" breeds, averaging for the ram 175 pounds and the ewe 135 pounds, and is the oldest pure breed of the mutton type. It is even lower set than the Shropshire,



and has as nearly a perfect mutton type, though on a small scale, as any of the so-called mutton breeds. It is so compactly made, and carries so much weight in such little bulk, that it is often described as the bullet type. For quality of mutton it is rarely surpassed, having an exceedingly fine flavor, with a large percentage of edible meat. In color the breed is of a rather grayish brown on the face, ears and legs, with a white fleece. There is a difference from the Shropshire both in length of fleece and distribution. The Southdown has a dense fleece, meaning one with a maximum number of fibers per square inch of surface, but it is considerably shorter than the Shropshire, there being more difference in the average shear of the breeds. The Southdown has no wool below the eyes, except, perhaps, tufts similar to those on the Shropshire's ears, nor are the legs woolled so far down. An especially commendable characteristic of the breed in form is its unusually thick and plump leg of mutton. The breed is thick fleshed throughout and is early in maturity, though not quite so heavy gains can be averaged as with the Shropshire. The breed does well on hilly land, is fairly hardy, yet thrives best on farms similar to those of the corn belt. For wool production, even combined with mutton, one would not choose the Southdown, their best use being in mutton raising. Ewes are not up to the Shropshire in prolificacy, averaging only from 120 to 130 per cent in the best flocks. The breed is too small for the average farmer, and does not clip a heavy enough fleece to satisfy one who wants a general-purpose sheep.

A larger breed than either the Shropshire or Southdown, ranking next to the Oxford among the "down" breeds, is the Hampshire, — a breed in which the rams will average close to 240 to 250 pounds, and the ewes nearly 200 pounds. More upstanding than either of the smaller sorts previously described, Hampshires are not nearly as compactly built. A large, black face, with black ears held in a peculiar manner, the whole head set on the neck rather strangely, are distinguishing characteristics. The fleece extends down on the face, only a little below the eyes, does not cover the ears, and usually leaves the fore legs below the knees bare. As a wool producer their rank is not high, because of a rather open fleece, with short staple. The breed is particularly noted for large size of lambs at birth and their early maturity.

The largest of the middle-wool breeds is another "down," the Oxford, which averages about 275 or more pounds for the ram, with mature ewes above 200 pounds. This breed has a longer fleece than any so far mentioned, but it is not so dense. Many flocks of Oxford sheep average close to 11 pounds of unwashed wool per head. Ewes are quite prolific, but scarcely lead the Shropshires at this point. Heavy gains can be made with Oxford lambs, but they require a longer time to fully mature than some other breeds, and do not fatten quite as evenly as would be desirable. The Oxford is best suited to rich farms, where plenty of grain can be furnished, and protection from the elements is more necessary than with other breeds. They resemble the Shropshire slightly, except for the larger size, larger head, clean face and longer, more pointed ears. Wool does not cover the legs as completely as in the Shropshire.

The Dorset horned breed is a white-faced, white-legged sheep, carrying a rather open but fairly long fleece, has quite good mutton type, though not quite so compact as the breeds already mentioned, but has peculiar characteristics which deserve mention. Rams average about 230 pounds, while ewes in fair flesh should tip the scales at close to 160 pounds, probably more. In quality of mutton they are some-

what inferior, not having so high a proportion of edible meat to whole carcass as the Southdown or even the Shropshire, ranking about medium in this regard. They are first class as early maturing stock and as wool producers. As feeders they do very well, standing pen feeding well and making rapid gains. In their native country they have long been famous for their tendency to breed at almost any time of the year; not only do they produce lambs twice a year if desired, but twins and triplets are fairly common. Of course in the winter lamb business one strong lamb is better than a pair of rather mediocre ones, quick growth being desired. The ewe will raise one lamb faster than two.

With these brief descriptions of the various breeds, serving as a partial guide for selection, the next step is establishing a flock. It is not necessary to build a new set of barns in starting in the sheep business, as many people imagine, the only shelter and protection required by sheep being dry quarters and sheds to protect them from cold, driving rains. A very economical way to start a flock is by the purchase of a few old ewes. Ewes of four to five years of age, if their teeth are still in fairly good condition, make a very satisfactory and yet economical foundation. They can be purchased from some large sheep breeder at a comparatively low price, because in a large flock it is best to keep only younger females, selling off the old ones after they show signs of poor teeth. It is not wise to attempt to save money on the ram in the same manner. "The sire is half the herd" is an old saying, as true as ever a proverb could be, but countless numbers of people fly right in the face of the advice it conveys and buy sires of a mediocre sort. With a herd of females of any sort the only way open for quick improvement is to purchase a sire that is better than the average of the flock. A good ram at a high price is cheaper than a medium individual at a low figure.

In the production of winter lambs more care should be taken in the selection of ewes than where the aim is to establish a good farm flock, as winter lambs must be good individuals to command the best prices, and should come from young, vigorous mothers if they are to grow the best, make the quickest start and finish the strongest. The above method of securing a foundation flock can therefore hardly be recommended as a beginning for the "hot-house lamb" business, but for any other sort of market production it will be very practical.

With a pure-bred sire on average ewes the first lamb crop will usually be an improvement over their dams. Out of this lot come the individuals which are to replace the old ewes, which seldom retain their usefulness much longer. If some of the old ewes show vigor and health, and retain a workable set of teeth, they may be used as breeders for another season, after which they should be discarded, as by that time a sufficient number of younger females will probably have been produced to serve as the foundation of the permanent flock. The ram first purchased can be used on the old ewes, and, if a strong ram, may be used on his offspring, provided they are exceedingly vigorous, but such use is rarely advisable. It is preferable to use another ram of even better breeding on the young ewes, and continue this process, getting as good a ram whenever needed as can be obtained. In this manner the quality of the flock will be continuously improved. It is their devotion to the highest grade of stock that has made the English breeders so successful, while our indifference to this point has prevented our attaining the same measure of success.

Ewes should be bred so as to drop lambs in March, or earlier if possible, because it is to the man first in the spring market with good



lambs that the greatest profits go. Keep the prospective mothers in good condition before breeding, and if any appear thinner than is desirable, "flush" them with grain, as they breed better when in fairly good flesh, coming in heat more easily and conception being more certain. After turning the ram with them for a week or so separate them again and begin preparing for the lambs. A clean, dry shed, where the snow and rain cannot beat in, with openings and pens for exercise on the south, should be furnished for lambing. If lambs are due in February or early March a closed room, which can be artificially heated, will be the means of saving many a lamb that would otherwise become chilled and die. A breeding register is very convenient, and will result in saving a good many lambs that are dropped weak. If a breeding register is kept there must be some way of marking ewes as they are served. As convenient a way as any is to smear the belly of the ram with red paint or lamp black and oil, so that when the ewes are served some of this will rub off on the rump. Those served may then be cut out daily, and an accurate record kept of when the lambs should be dropped. Guess work is done away with at lambing time, and the ewes are not shut into the lambing pens until the proper time. A good shepherd will watch every ewe until she yeans, and will see that the lamb stands and takes nourishment before he leaves. This trouble is well paid for if only three or four lambs are saved, especially if intended for winter lambs, selling at from \$6 to \$8 per head at ninety days from birth.

After the birth of the lambs if the weather is severe and damp, as it sometimes is in February and March, the artificial heat should be kept up for two or three days, but after this period it is no longer necessary if the ewe and her youngster are removed to a clean, dry pen. The time when harm results from chilled lambs is immediately following birth, or when the little ones become wet in cold weather.

In preparing the lamb for market one should begin as soon as it is born. After parturition feed the ewe well, so as to induce a strong flow of milk. The more plentiful supply she has the faster the lamb will grow and the earlier he will reach the market. After two or three weeks he will begin to nibble at grain and eat small quantities. A "creep" should then be built, so that he may have access to finely ground grain, which should be of a somewhat different mixture from the feed that the mother gets, consisting preferably of corn meal, bran and a small quantity of oil meal. The "creep" allows only the small lambs to get at this particular mixture. Corn has been proved by repeated trials to give the quickest results, as its fattening qualities, in conjunction with the mother's milk, give very quick growth. It should not be given alone on account of the heaviness of the feed, its effect on the digestive system, when so fed, being rather harmful. If a few roots — turnips or mangels — are available they make an excellent feed, and cabbages will produce very good results. Lambs do not eat much roughage, but will eat a little clover hay if allowed access to it. Being a protein fodder the clover hay will help considerably in the growth. It is essential in feeding young things of any sort to see that flesh-forming and bone-producing foods are fed, to supplement the fattening grains given. Feeds high in protein and containing considerable ash should be given, along with corn. Bran is added to the above mixture for that reason, containing a fairly high percentage of protein and being high in ash content. Oil meal contains a large amount of protein, and has a slightly laxative effect on the bowels, thus leading to a good condition of the digestive organs.

If good pasture is available little grain is necessary, but it should be

given, even then, for stock that is being hurried to maturity. In early spring, when pasture is not plentiful, rye sown the previous fall makes good green fodder. Later on rape may be used to supplement failing pastures, but sheep should never be turned on rape when very hungry, because of the danger of bloating.

Docking and castrating may be done at the same or different times, as suits the convenience of the shepherd. In many instances docking is done first, and the castration when the lambs become stronger, thus not setting them back as much. Early lambs, those marketed at from forty to ninety days, need not be castrated or docked. Those kept longer should be castrated, as their flesh becomes rather coarse in texture and has not so desirable a flavor if they are not altered. Undocked tails make sheep foul and unattractive, and for that reason should be removed from all except early lambs.

Docking may be done with a sharp knife, cutting off the tail about an inch and a half or two inches from the body. The division should be made at one of the joints for clean work and best results. Both docking and castration should be done when the ground is dry and the weather dry and moderately warm. Damp quarters tend to infection of wounds, and if the weather is good the stock will more easily and quickly recover than when cold, wet days are the rule. Both operations should be done when the lambs are but a few weeks old.

When young lambs show the presence of worms in the alimentary canal, causing severe emaciation, they are probably the stomach or other variety of the round worm. These may be gotten rid of by giving small doses of turpentine and linseed oil, being careful that no portion of it enters the lungs, where it will cause death much more quickly and surely than can the stomach worms themselves.

Weaning may be done as soon as the ewe shows signs of a very much decreased flow of milk. It is not necessary to wean winter lambs at all, but those kept for later markets may be weaned easily and without much loss at from three to four months. Gradual weaning is best, instead of taking away the ewes suddenly. Lambs that before weaning have been fed the mixture of corn, bran and oil meal suggested above may be rapidly fattened on a mixture of two parts corn and one part linseed meal. If feeding for fall market, begin early enough to have the lambs well fattened before the pastures become so scant as to necessitate a change to dry roughage.

The ram to be used should possess good mutton type and be an impressive appearing individual, showing the leading characteristics of his breed. For some time previous to the breeding season he should be well fed on grain which is not too fattening. A highly fattened ram is poorer for breeding purposes than one in rather thin condition, and is not at all sure in such a condition. A standard grain ration is made up of oats and bran, fed rather lightly. Such feeds seem to improve the ram's condition, so that he is eager and sure and in full vigor, — a condition much to be desired. It is also essential in preparing him for the breeding season that he should have plenty of exercise. Good feeding without exercise spoils his usefulness, so that plenty of room for exercise should be provided under all circumstances. He may be housed during the day and allowed the run of a good pasture during the night, if one well protected from dogs is available.

The number of ewes a ram will serve in a single season, and insure good results, is of course dependent upon his age, vigor and management. A vigorous ram, allowed to run loose in a large flock, will no doubt serve more lambs than is best for his own constitution and for the lambs to follow. An average mature ram, running at large with



the flock during breeding season, should not be expected to serve more than 30 or 40 ewes. A lamb ram should not be allowed more than 15 or 20 females, a yearling or "shearling" ought to be confined to not more than 40, and 60 ewes is the outside limit for any vigorous and mature lamb if best results are desired. Between the ages of two and six years a buck is in his prime. With the ordinary flock in this State it is as good a plan as any to turn the ram with the ewes when the breeding season arrives. If he has been fed grain liberally before the breeding season a slight grain ration should be continued if possible, but he will do well on pasture alone. After the ewes have all been bred the grain ration should be cut down gradually, and the ram eventually allowed to pick his living from pastures and roughage, taking care not to starve him, as many do.

Ewes should be bred to drop lambs as early in the winter as accommodations for taking care of them are available. If the farmer has no sheds which are dry, and is without one or two rooms which may be artificially heated on severely cold days, it is useless to think of producing February lambs. Early lambs are desirable, as they may be marketed before the hottest weather, when infection and loss from parasites are most likely, and the early market is also the best. A good fall market may be had also, but in breeding for the fall market considerable more care and risk will be necessary in carrying the animals through the summer than if they are sold before the latter part of June.

#### WINTER LAMBS.

The term "hot-house lambs" is misleading, as most people imagine that their production requires extremely artificial conditions, which is not true in the sense they mean. The conditions required are not nearly so artificial as are furnished dairy cattle and horses. The "hot-house lamb" is simply a lamb born in November or December, fattened and sold during the first ten weeks of the new year, when there is a strong demand for choice lambs from 45 to 60 pounds in weight. They will bring very favorable prices, averaging from \$8 to \$10 per head, and the demand is always stronger than the supply. The chief markets are in the larger cities, so the selling must either be done through commission men or a fancy private butcher trade built up. If possible, it is desirable to deal directly with some large market, or to furnish hotels with lambs direct from the farm.

In producing "hot-house lambs" immunity from parasites is obtained, thus avoiding one of the most serious handicaps of the business. The lambs suffer from parasites more severely than their dams, being young and comparatively weak, but winter lambs cannot suffer, as it is when feeding in pasture that the parasites obtain a foothold. The winter months are, as a rule, a time when work on the farm is somewhat slack, and the production of the Christmas lamb requires considerable work during this slack season, thus giving a better distribution of labor on the farm. Not only are the highest prices for the lambs obtained at this season, but as they are sold earlier than at other times they return more pounds of gain per pound of food, and their cost is therefore at a minimum.

In the production of winter lambs certain peculiar conditions must be met, and careful attention given to the details, which make the difference between profit and loss. This puts the "hot-house lamb" business into the hands of the man who is careful and methodical about his work. The first requisite is that the lambs shall come at the proper season, in November or December. October lambs would most likely

be all right here, though too early in the west. They must be marketed during the Christmas holidays, as they will be too heavy to sell as fancy lambs if held much later. The heaviest demand is from the first of January to the middle of March, so it is best to have the ewes year in November or December. The period of gestation in sheep ranges from 150 to 154 days, so they must be bred in June or July. Ewes of ordinary breeds will not accept the ram at that season, and the Dorsets and their grades are the only ones that can be depended upon to produce lambs in November or December. Dorset-Merino grades have been found very satisfactory, also the Dorset-Shropshire, though the latter is not as certain to breed at the proper season. Good grade ewes are preferable as mothers for raising such lambs, as they are cheaper and are usually stronger and more vigorous mothers. The rams should be pure bred, as grade sires are not prepotent, consequently failing to sire lambs of uniform merit. Bearing in mind that lambs of good size, possessing first-class quality, with high grade of flesh and good feeders, are the object, some breed possessing these characteristics should furnish the ram. For the largest lambs and good quality of flesh Hampshire rams are very good. In this State, as the Shropshire is the most popular and rams of the breed easily obtainable, it would seem best to select good, vigorous and good-sized Shropshire sires.

The ewes should be sheared early and kept on light food from March until the latter part of May, aiming at only medium condition. Pasture them in May, to keep them gaining until bred. When pasture is not good they should receive grain in addition. Rams should be in similar condition. The preferable plan is to keep the ram with the ewes at night only, but it is usually more convenient to turn them with the flock, letting them remain all the time, until every ewe has been bred. After they have all taken the ram he should be removed from the same pasture.

The barn or shed in which the ewes and lambs are to be cared for should be wind proof, reasonably warm, and considerable glass on the south side is an advantage. The best of ventilation should be arranged. It is advisable to provide separate quarters for the lambs, separated from the ewes by a "creep." Only sufficient bedding to keep the sheep clean is necessary, an excess being objectionable. Gypsum will keep down the ammonia from the fermenting manure. Supply salt and water in the barn, so that the ewes and lambs need not go out doors from the time they are put in until the young animals are slaughtered and sold.

Feeding should be about the same as for ordinary lambs, except that more protein must be furnished the winter lamb, and he should be forced, if possible, to eat more grain all the time. Carrots and Swede turnips are very valuable for the ewes and a few may be given the lambs, although bright, fresh silage, which has never been frozen, is as well for palatability and more economical. The guide as to the amount of feed both for ewes and young is their general thrift. Keep enough food before the ewes at all times to insure a full flow of milk, as it is from this source that the quickest and steadiest gain for the lambs must come. Corn meal and wheat bran in the proportion of three of meal to one of bran is a very excellent mixture for the lambs, and if fed with good clover hay will produce surprising growth. If silage or chopped roots are available it should be fed once a day, with bran and meal sprinkled over it. Feeding three times a day all the grain that will be cleaned up is recommended. Troughs for both mother and offspring should be cleaned thoroughly at each feed. Silage taken



from the bottom of the silo is likely to prove harmful, because of the acid in this part.

With proper care in feeding, weights of from 45 to 60 pounds in from eight to ten weeks should be the rule, and the lambs should be very fat. They should be in such condition from the start that they will be ready to sell at any time. They should now be slaughtered and "hog dressed," to prepare them for the market. This is more or less of a fancy operation, requiring care and skill, since a well-dressed carcass will far outsell one that is poorly finished. In this connection no better advice can be given than that by Dr. H. P. Miller of Ohio, who has had considerable experience with the winter lamb. He says:—

The preparation for market requires some skill, yet only such as almost any one can develop after carefully studying directions. Methods of preparation have been greatly simplified, and the lambs seem apparently to continue to sell as well as before.

It is important to have them thoroughly bled out. To secure this it has been found of advantage to suspend the lamb from the hind feet in killing. Suspend a short singletree about six feet from the ground. Loop a small rope or strong twine about each hind leg and attach to the hooks of the singletree. With a sharp-pointed knife sever the artery and vein in the neck, close to the head. Be sure to sever the artery. Bright red blood is the assurance. The venous blood is dark. Severing the head with a broad axe would perhaps cause less suffering and insure thorough bleeding. The head is removed with a knife as soon as the lamb stops bleeding. Clip the wool from the brisket and a strip four or five inches wide upward to the udder or scrotum, also from between the hind legs, as in tagging sheep. Slit the skin up the inside of the hind quarters about four inches, and loosen the skin from the underlying muscles for about two inches on either side of the openings in the skin for the attachment of the caul fat. This should be removed from the stomachs before they are detached, and in very cold weather placed in warm water until ready to use. Next remove the stomach and intestines. In the early part of the season the liver, heart and lungs are not removed, but when the weather gets warm they must be. Carefully spread the caul fat over all the exposed flesh. Good toothpicks should be provided for attaching it and holding it in place. Make small slits in it over the kidneys and pull them through. In this part of the work is where skill is required to make the carcass attractive. Now hang it in a cool place for twelve to twenty-four hours. In extremely cold weather twelve hours is long enough, but it is better to make twenty-four the rule. Then neatly sew a square yard of clean muslin about each lamb, so as to cover up all exposed surface. It was formerly customary to wrap each one in burlap and attach it to a stretcher, but now three lambs are placed in a light crate, with burlap tacked over the top. The crate is lined with heavy paper. Prepare them as shortly before shipping as possible. In warm weather ice may be put *between* the lambs, not *in* them. Send them as they are ready, three or six at a time. The market varies greatly, depending upon the weather and the number arriving. It is not possible to get them all on a high market. Aim to slaughter regularly each week, keeping your customers advised as to when, and how many you will be likely to ship.

With the special opportunities that are apparent in a large part of the State why not grow a home product of widely known quality for home use? The demand of Boston, Hartford and New York, selecting these cities at random, could be partially supplied by home-grown sheep, for which a fancy price would be paid if the consumer were assured of the value and high quality of the product. Mutton is the sweetest and most tender of meat, lacking the grossness and coarse texture of beef, and possessing a cleaner and more wholesome flavor than pork. It will suit the daintiest palate and satisfy the heartiest appetite. Who has ever partaken of a nicely turned leg o'mutton, tastily garnished and attractively served, whose mouth doesn't water for another such feast? Massachusetts could and should take up sheep growing as a much larger part of her activity than it is at present.









MASSACHUSETTS  
CROP REPORT

FOR THE

MONTH OF JULY, 1908.

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DRAINAGE.

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*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF  
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER  
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# CROP REPORT FOR THE MONTH OF JULY, 1908.

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OFFICE OF STATE BOARD OF AGRICULTURE,  
BOSTON, MASS., Aug. 1, 1908.

In presenting the Crop Report for the month of July, Bulletin No. 3 of the current series, we desire to call attention to the article on "Drainage," at the close of the bulletin, by Prof. Wm. P. Brooks, Director of the Massachusetts Agricultural Experiment Station. There is a great deal of land in Massachusetts which could be greatly improved by the establishment of a system of artificial drainage, and this article gives full instructions as to the installing of such systems. Professor Brooks has had much practical experience with the work of farm drainage on the farm of the Massachusetts Agricultural College, where many acres of land have been reclaimed and improved by this means, and is also fully posted on the theoretical side of the question.

## PROGRESS OF THE SEASON.

The Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for July, 1907) finds the preliminary estimate of the acreage planted in corn to be 100,996,000 acres, an increase of 1,065,000 acres, or 1.1 per cent, as compared with the final estimate of the acreage planted last year. The average condition of the corn crop on July 1 was 82.8 per cent of a normal, as compared with 80.2 on July 1, 1907, 87.5 on July 1, 1906, and 85.6, the ten-year average on July 1.

The average condition of spring wheat on July 1 was 89.4 per cent of a normal, as compared with 95 last month, 87.2 on July 1, 1907, and 87.6, the ten-year average on July 1. The average condition of winter wheat at time of harvest was 80.6, as compared with 86 on June 1, 78.3 at harvest, 1907, and 80.2, the average at the time of harvest for the

past ten years. The average condition on July 1 of spring and winter wheat combined was 83.9, as compared with 89.4 a month earlier, 81.6 on July 1, 1907, and 82.9, the ten-year average. The amount of wheat remaining in the hands of farmers on July 1 was estimated at 5.3 per cent of last year's crop, equivalent to 33,797,000 bushels.

The average condition of the oats crop on July 1 was 85.7, as compared with 92.9 a month earlier, 81 on July 1, 1907, 84 on July 1, 1906, 92.1 on July 1, 1905, and 87.5, the ten-year average.

The average condition of barley on July 1 was 86.2 per cent of a normal, as compared with 89.7 a month earlier, 84.4 on July 1, 1907, 92.5 on July 1, 1906, and 88.3, the ten-year average on that date.

The average condition of rye on July 1 was 91.2 per cent of a normal, as compared with 91.3 last month, 89.7 on July 1, 1907, 91.3 on July 1, 1906, and 90.1, the ten-year average on July 1.

The average condition of the hay crop on July 1 was 92.6 per cent of a normal, as compared with 96.8 a month earlier, and approximately 82 on July 1, 1907. The condition of timothy on July 1 was 90.2 per cent, as compared with 82.2 on July 1, 1907, and 86, the ten-year average; clover 95.5 on July 1, as compared with 76.4 on July 1, 1907, and 84, the ten-year average.

The condition of the apple crop on July 1 was 57.6, as compared with 66 on June 1, 44 on July 1, 1907, and 62.3, the ten-year average on July 1.

The acreage of Irish potatoes is estimated as 3,198,000 acres; that is, 2.4 per cent, or 74,000 acres, more than last year. The condition of the crop on July 1 was 89.6 per cent of a normal, as compared with 90.2 on July 1, 1907, 91.5 on July 1, 1906, and 91.6, the ten-year average on July 1.

The acreage of tobacco is estimated as 763,000 acres; that is, 7 per cent, or 58,000 acres, less than last year. The condition of the crop on July 1 was 86.6 per cent of a normal, as compared with 81.3 on July 1, 1907, 86.7 on July 1, 1906, and 86, the ten-year average.



In Massachusetts the acreage of corn is 45,000 acres, or 102, as compared with last year, and the condition on July 1 was 97; the average condition of oats was 98; the average condition of rye, 94; the acreage of tobacco 4,512 acres, or 96, as compared with last year, and the condition 95; the acreage of Irish potatoes was 32,000, or 105, as compared with last year, and the average condition 92; the average condition of timothy was 90, the average condition of clover, 88, and the average condition of all tame hay, 90; the average condition of pastures, 93; the average condition of apples, 77; the average condition of peaches, 80; the average condition of pears, 87; the average condition of grapes, 85; the average condition of tomatoes, 90; the average condition of cabbages, 92; and the average condition of onions, 90.

#### TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES NATIONAL WEEKLY WEATHER BULLETIN.]

*Week ending July 6.* — The mean temperature was below the normal over the entire district between the Mississippi River and the Rocky Mountains, the average deficiency ranging from 3° to 6° daily. The mean temperature was above the normal from the lower lakes, Ohio valley and east Gulf States, northeastward over the Atlantic coast States and New England, and also over the districts west of the Rocky Mountains. The precipitation was generally above the normal from South Dakota and southern Minnesota southward to Oklahoma and northern Texas, throughout Illinois and much of Indiana and Ohio. There was a deficiency in the week's rainfall throughout a gradually widening area from the upper Ohio valley northeastward, to include practically the whole of New England, from the headwaters of the Missouri eastward to the Lakes, and from the Plateau region westward to the Pacific Ocean.

*Week ending July 13.* — The mean temperature for the week continued below the normal over the lower Missouri and middle Mississippi valleys, though somewhat less pronounced than in the previous week. The mean temperature was also slightly below the normal over most of the Gulf

and South Atlantic States. The mean temperature continued high over New England and the Lake region, ranging from  $3^{\circ}$  to  $8^{\circ}$  daily above the normal, also over the Plateau and Pacific coast districts. The precipitation for the week was above the normal in South Dakota, Nebraska, northeastern Kansas, portions of the southern States, throughout the interior of New York and portions of Michigan and Wisconsin. The precipitation was below normal in the remaining portions of the country, the deficiency amounting to more than half an inch from the upper Missouri valley eastward to Lake Superior, in New England, New Jersey and Virginia.

*Week ending July 20.* — The mean temperature continued below normal over the greater part of the region between the Mississippi valley and the Rocky Mountains, and the cool area extended eastward over the Ohio valley, Lake region and northern New England, the deficiency ranging from  $3^{\circ}$  to  $6^{\circ}$ . From the lower Mississippi valley eastward over the Gulf States and along the Atlantic coast to New England the mean temperature was above the normal, also over the upper Missouri valley and the Pacific coast States. The rainfall was in excess of the normal from the central Washington coast eastward to the upper Missouri valley, throughout the greater part of the Lake region and New England, the rainfall ranging from 1 to 2 inches. The week was comparatively dry from the central Plateau region to the eastern portions of the Dakotas, over Kansas, Nebraska and northern Oklahoma, and along the southern Atlantic coast.

*Week ending July 27.* — The mean temperature continued below the normal from Texas northeastward over the middle Mississippi and lower Ohio valleys to the lower Lake region, also over most of the Gulf States and locally on the Pacific coast. The mean temperature was above normal over most of the Pacific coast districts, and thence northeasterly over the middle and northern Plateau and mountain districts to the upper Lakes, and over the Atlantic coast from southern New England to Florida. The rainfall was above the normal throughout the greater part of the country from the central

Mississippi and lower Ohio valleys northeastward to southern New England and eastward to the Virginia coast. The precipitation was generally below normal over the lower Missouri and upper Mississippi valleys and upper Lake region, in northern New England, and throughout the Atlantic coast States south of Virginia.

## SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

*Week ending July 6.* — New England. Boston: The mean temperature was much above the normal; the maximum temperature was between  $83^{\circ}$  and  $90^{\circ}$  nearly every day. Local showers and thunderstorms occurred in nearly all parts of New England during the week, but the rainfall was light and drought continues, except in parts of New Hampshire and the Connecticut valley sections of Massachusetts and Connecticut, where severe local storms gave from .50 of an inch to 1.70 inches rainfall on the 2d. The sunshine was normal.

*Week ending July 13.* — New England. Boston: The weather continued very warm and dry. Maximum temperatures above  $95^{\circ}$  were general on the 12th. No rain occurred during the week, except very light showers in a few localities. Drought continues with increasing severity and is causing much injury. Clear weather prevailed every day of the week.

*Week ending July 20.* — New England. Boston: Temperatures were high the first two days and moderate the remainder of the week, averaging about normal. The severe drought was broken by frequent showers; rainfall for the week generally between 1 and 1.5 inches, except in some localities in central and eastern Massachusetts, where only about .5 of an inch fell. Sunshine was about the average.

*Week ending July 27.* — New England. Boston: The temperatures were about normal, except on the 23d, when they were decidedly above, with the highest,  $93^{\circ}$ , in Massachusetts, and on the 25th, when they were decidedly below, with the lowest maximum,  $64^{\circ}$ , in New Hampshire. Light to copious rains fell throughout the district on the 22d and



25th, generally heaviest in the northern portion on the former date and in the southern portion on the latter date, several stations reporting more than 1 inch on both dates. Occasional showers on other dates, except in Maine.

### WEATHER OF JULY, 1908.

The drought that prevailed through June continued almost uninterruptedly until the middle of July, the only exceptions being local showers in a few scattered sections. From the 16th to the 20th, inclusive, showers were quite general, with the rainfall ranging from light to copious in amounts. Again, on the 25th, showers occurred in all sections of the State, with amounts ranging a quarter of an inch to near two inches. The rainfall for the rest of the month was light and irregularly distributed. The rains of the latter half of the month, while they fell greatly short of the general needs, were of great benefit to parched and stunted vegetation, and served to at least temporarily break the severe drought that had prevailed since the close of May. A conspicuous feature of the weather of the month was the unusual prevalence of sunshine, and the month will go on record as one of the most sunny of record. The temperature ranged uniformly high throughout the month, with the monthly mean ranging from  $2^{\circ}$  to  $5^{\circ}$  above the July normal. On an average the maximum temperatures were  $90^{\circ}$  or above on from ten to fourteen days. In a number of instances the maximum temperatures were the highest of record for July. The night temperatures were also unusually high, in numerous instances the minimum temperatures falling little, if any, below  $80^{\circ}$ . The winds of the month were light, and generally from southerly to westerly. The month as a whole was one of the warmest and driest of record.

In the circular to correspondents, returnable July 23, the following questions were asked:—

1. What insects are proving most troublesome in your locality?

2. What is the condition of Indian corn, and what proportion of the crop will be put into the silo?



3. What is the quantity and quality of the hay crop as compared with former years?

4. What forage crops are being raised to supplement the hay crop, for the silo, and to eke out the pastures, and what is their condition?

5. What is the condition of market-garden crops, including potatoes, and how have those already harvested compared in yield and price with former years?

6. What is the prospect for apples, pears, peaches, plums, quinces, grapes and cranberries?

7. What is the condition of pasturage in your locality?

8. How have rye, oats and barley compared with former years, both as grain and forage crops?

Returns were received from 138 correspondents, and from them the following summary has been compiled:—

#### INSECTS.

Insects are apparently much less numerous and destructive than usual. The potato beetle is reported by less than half the correspondents and is not doing any considerable damage in any section. The elm leaf beetle is more numerous than usual, and seems to be more widely distributed than ever, practically a fourth of the correspondents mentioning this insect. This Board has a Nature Leaflet on the elm leaf beetle in process of preparation which we shall be glad to mail to any applying for it. Gypsy moths also appear to be more widely distributed than formerly, and to have done noticeable damage in more than the usual number of sections. Other insects reported are currant worms, grasshoppers, cabbage worms, wire worms, forest tent caterpillars, white grubs, cattle flies, brown-tail moth caterpillars, fall web worms, squash bugs, plant lice, cut worms, cranberry vine worms, canker worms, the San José scale and onion maggots.

#### INDIAN CORN.

Indian corn has apparently suffered very little from the continued drought, taking the State as a whole, and the crop was reported as being in excellent condition, of good stand and color, and generally forward for the time of year, though

some report that it has been checked by the drought. With favorable conditions as to heat and moisture during August and the first week of September the crop should mature nicely and should give a more than average yield. A recurrence of the droughty condition would undoubtedly seriously damage even the corn crop. Silos gain in favor in the dairy sections, and there the greater part of the crop is used for ensilage, but elsewhere they are not used to any extent, even being neglected in many cases by those farmers who are engaged in milk production.

### THE HAY CROP.

The hay crop had been practically all secured at the time of making returns, and indeed in most sections much earlier. It is generally reported as being less than an average crop, only a few correspondents reporting it as average or above. Probably a fair averaging of the reports would give the conclusion that there was about three-fourths of a normal crop secured for the State as a whole. It was generally secured in excellent condition, and was reported as of excellent quality. Rowen did not promise very well at time of making returns, owing to the severe dry weather just after the first crop was removed, but frequent rains would doubtless improve the outlook.

### FORAGE CROPS.

There is about the usual area devoted to forage crops in most sections, though there are numerous reports from the southeastern counties that none were sown, owing to the ground being too dry for the seed to germinate. Corn is the crop most commonly grown for this purpose, with the millets and oats following, in second and third places, and Hungarian grass and barley coming closely together after them in the order named. Barley is the favorite crop for late forage. Oats and peas, sown together, are raised to a considerable extent. Other forage crops are rye, wheat, mangels and carrots.

## MARKET-GARDEN CROPS.

Market-garden crops suffered severely in most sections from the long-continued drought, and those harvested have given yields considerably below the normal. Prices have not been correspondingly high, but as a general thing have ruled below former years, rather than above. With the coming of rain those still to be harvested have shown improvement, and, barring a recurrence of drought, should do well.

## POTATOES.

Very few potatoes had been dug at the time of making returns, but the crop was expected to be a very light one. Prices were high, so far as reported on. Late potatoes promise a better yield than the early varieties, but it is a question if the late crop has not been seriously shortened by the drought. This crop shows the effects of the lack of rain more plainly than almost any other.

## FRUITS.

Apples will be only a light crop for the State as a whole, winter varieties being much less promising than earlier ones. They have fallen badly, owing to dry weather, and those remaining will in all probability be small. Some early varieties are reported as already on the market, an unusually forward condition for the crop. Pears, peaches and plums show even more unfavorable conditions than a month ago, and will generally be very light crops. Quinces are somewhat better, so far as reported on, but not an average crop. Grapes set very full and promise an excellent crop at the present time. Cranberries are reported as having suffered from drought, and the result as to the crop is in doubt at present. Wild berries are plentiful and apparently uninjured by the drought.

## PASTURAGE.

Feed in pastures was very short in almost all sections and some report them to be as dry and brown as in November. Generally, however, they have been kept along by showers,

and have responded excellently to the general showers that came just before the time for making returns. It is very seldom that feed remains green and growing in our New England pastures throughout the season, and save in eastern sections they have been fully up to the average of other years in condition.

#### SMALL GRAINS.

Rye, oats and barley, where grown for grain, apparently came on sufficiently early to escape the worst effects of the drought, and were fair crops. Oats seem to have done well where grown for hay, and barley is reported to promise well as a late forage crop.



## NOTES OF CORRESPONDENTS.

(Returned to us July 23.)

## BERKSHIRE COUNTY.

*New Marlborough* (E. W. RHOADES). — Cabbage worms are doing a great deal of damage. Indian corn continues to look finely and only a small part of the crop will be put into the silo. There is an average crop of hay of good quality. A few sow oats to cut for hay; corn for fall feeding is making a heavy growth. Early potatoes have done well, but the prices have been rather low. The prospect for the apple crop is not very good; pears and peaches only fair; grapevines seem to hang full. Everywhere the pastures are green and good. There is a big rye crop; oats are looking finely; no barley sown of late years. Some cabbages are raised to supply the local market.

*Tyringham* (EDWARD H. SLATER). — Potato bugs and cabbage worms are causing some trouble. Corn is in fair condition and one-third of the crop will be put into the silo. The hay crop is hardly an average one, but is of good quality. Sowed corn and Japanese millet are raised to help out the pastures. No potatoes have been harvested, but the crop is looking well. There will be average yields of apples and pears. Pastures have held out well, but are now falling short. Rye and oats compare favorably with former years, both as grain and forage crops.

*Alford* (LESTER T. OSBORNE). — Insects are much less troublesome than usual. Conditions for Indian corn have been very favorable; perhaps one-third the crop is used for ensilage. The hay crop is not as large as last year, but is up to the average in quantity and quality. Forage crops are little raised, except corn, which is in fine condition. Market-garden crops and potatoes are above the average. Apples will be less than an average crop; but fruit as a whole promises well. Pasturage is a little short on account of dry weather. Rye, oats and barley are about up to the average.

*Becket* (WM. H. SNOW). — Potato bugs are doing some damage. Corn looks fairly well and probably three-fourths of it will go into the silo. The hay crop is light, but of good quality. Oats, corn and millet are raised as forage crops. Prices for market-garden crops are good, but yields are light. The prospect is good for all fruits; many apples have fallen, making the chances of those left better. Pastures are in very good condition. We have had many showers here.

*West Stockbridge* (J. S. MOORE). — Potato bugs and currant worms

are doing some damage, but not as much as in some years. Indian corn is in better than average condition; no silos in town. The hay crop improved during the last few weeks and is a normal crop. Oats and corn are raised as forage crops. The prospect is good for the potato crop. There will be fair yields of apples and pears; few plums; no peaches, quinces or cranberries grown. Recent rains have improved pastures and there will be no shortage of feed. Oats are looking well. Farm products are higher and the question of help is about the only drawback to successful farming.

*Hancock* (B. H. GOODRICH). — Potato bugs are doing some damage. The acreage of Indian corn is less than usual and it is in average condition. The hay crop was good in both quantity and quality. Corn is the principal crop grown for forage, with a little millet, and they are in good condition. Potatoes are looking well; other market-garden crops only grown for home use. Apples will be rather less than an average crop for the bearing year. Pasturage is in good condition. Rye, oats and barley are looking well. Much hay remains unharvested, owing to wet weather.

*Peru* (F. G. CREAMER). — Potato bugs are doing some damage. Corn looks well and very little of it is grown for ensilage. There was about two-thirds of a normal crop of hay. Oats and corn are the principal forage crops grown. Gardens look well; no new potatoes have been dug as yet. Pastures look finely. Oats are looking well.

*Windsor* (HARRY A. FORD). — Potato bugs and grasshoppers are doing some damage. It is too early to judge as to the yield of Indian corn. The hay crop was two-thirds of the normal in quantity, but of good quality. Corn and oats are the principal forage crops grown. Potatoes are not quite ready to dig at present. Fruit of all kinds promises well, except Baldwin apples. Pasturage is in good condition. Rye is a good crop. We had a much-needed rain on the morning of the 22d.

*Cheshire* (L. J. NORTHUP). — Potato bugs are quite numerous and doing considerable damage. The condition of Indian corn is very promising; probably half the crop will go into the silo. The quantity and quality of the hay crop are equal to former years. Fodder corn is the principal forage crop and is in extra good condition. Market-garden crops are promising and compare well with other years in yield and price. The prospect for apples is that there will be about a three-fourths crop; pears and grapes quite plenty. Pastures are more promising than two weeks ago. Oats are looking finely; barley and rye not much raised. On the whole everything is very promising.

#### FRANKLIN COUNTY.

*Monroe* (DAVID H. SHERMAN). — Potato bugs and grasshoppers are doing some damage. Corn is late and nearly all is raised for use in the silo. The hay crop is about 80 per cent of a normal yield and of good quality. Oats and peas, barley, millet and corn are the forage crops

grown, and they are in good condition. Potatoes have not been harvested as yet, but are looking well. There will be no apples to speak of; few pears and plums; some grapes. Pasturage is in fair condition. Rye, oats and barley are average crops.

*Charlemont* (J. M. J. LEGATE). — Potato bugs are the only insects doing damage and they are not as plenty as usual. Corn is looking finely and probably half will go into the silo. The quantity of the hay crop was below the average, but the quality was never better. Corn and oats are the principal crops grown for forage and are in fine condition. Potatoes are looking well, none having been dug as yet. There will be light yields of apples and pears. Pasturage is in fair condition, though the drought injured it somewhat. Rye, oats and barley are little raised. Onions look well so far as raised.

*Leyden* (FRANK R. FOSTER). — Grasshoppers are causing some injury. Indian corn is in good condition and half the crop is grown for the silo. There was three-fourths of an average crop of hay of the best quality. Oats, barley and millet are raised for forage and are in good condition. Potatoes are badly affected by dry weather and bugs; none harvested as yet. There is prospect of a fair apple crop and a good yield of pears. Pastures are short. Rye, oats and barley are average crops.

*Deerfield* (DWIGHT A. HAWKS). — Indian corn is in good condition and about 10 per cent of the crop will be used for the silo. The hay crop was short 20 per cent in yield, but was of good quality. Sweet corn, millet and peas and oats are raised as forage crops and are in good condition. Potatoes are yielding but little more than half a crop. Apples and pears will give short yields. Pastures are in fair condition and recent showers have done much to improve them.

*Sunderland* (GEO. P. SMITH). — No insects are proving more troublesome than common. Indian corn is better than an average crop and about one-half is grown for the silo. There was about a three-fourths crop of hay of good quality and secured with little damage from rain. Corn is the only forage crop grown. Potatoes are a light crop, owing to drought; other market-garden crops good with prices lower than last year. Apples are about half a crop, some pears and grapes. Pastures have been injured by drought and feed is short. Rye, oats and barley are little grown except for cover crops. Onions have suffered somewhat from drought and thrips and promise only a light yield. Tobacco is doing well and there is promise of a good crop.

*Montague* (A. M. LYMAN). — Indian corn is in good condition, but is a little backward. The hay crop was about normal in quantity and quality. Millet and fodder corn are the principal forage crops grown. Market-garden crops are in fair condition. Apples and pears promise well; peaches and plums few; grapes promise a heavy yield; no quinces or cranberries grown. The drought has shortened feed in pastures very much. Grain crops have turned out well. Tobacco



promises unusually well and onions will be a fair crop. Pease have done well, also beans.

*Northfield* (THOMAS R. CALLENDER). — There are fewer insect pests than usual. Corn looks well in spite of dry weather; about half the crop goes into the silo. There was about two-thirds of a first-class crop of hay. Oats, peas and oats, millet and fodder corn are raised as forage crops and are generally good. All garden crops show the effects of dry weather; potatoes will be a failure without heavy rains soon. There will be a fair crop of apples. Pastures are badly burned and need rain. Rye and oats are fully up to the average. Cucumbers are looking well and promise an abundant yield of pickles.

*Wendell* (N. D. PLUMB). — Potato bugs and cabbage worms are doing some damage. Corn is very backward owing to the dry weather; about one-fourth the crop is used for silage. The hay crop was of good quality and about three-fourths the normal in yield. Oats, barley and corn are raised for forage and are in fair condition. Early potatoes are not half a crop and prices are the highest for years. Apples and pears promise average yields. Pastures are in poor condition. Oats are an average crop; no rye raised in town this year.

*Orange* (A. C. WHITE). — Potato bugs are doing some damage. Indian corn looks finely. The hay crop is about three-fourths of the normal in yield and of first-class quality. Apples are dropping from the trees badly. We had no rain of any amount from May 30 until last week and everything but corn looked like a failure, but recent showers seem to have given new life.

#### HAMPSHIRE COUNTY.

*Ware* (J. H. FLETCHER). — No insects are proving especially troublesome. Corn is looking well, but is a little late; most of the crop is grown for grain. Hay is a very good crop on well-cared-for land, and is of good quality. Millet, corn and barley are the forage crops grown. Market-garden crops are about average in yield and price. Apples on some farms promise very well; peaches on high land good. The dry June cut short the pasturage, but they are looking good just now. Rye, oats and barley are about the same as last year.

*Greenwich* (W. H. GLAZIER). — Potato bugs are not doing as much damage as usual. Indian corn is looking well and nearly all will be cured for grain. There was about a three-fourths crop of hay of excellent quality. But few forage crops are being grown, some oats and millet. Potatoes are looking well, but none have been dug as yet; market-garden crops not grown. Fruits are not grown to any amount. Pasturage has been much injured by dry weather. Some oats are grown for hay; no rye or barley of account. A few showers of late have helped corn and potatoes, but a good rain is much needed.

*Pelham* (JOHN L. BREWER). — Potato bugs and grasshoppers are doing some damage. Indian corn is looking finely; none will be siloed.



The hay crop is deficient in quantity, but of fine quality. Sweet corn, millet and barley are raised as forage crops. Early potatoes are few and small. The prospect is good for all fruits except pears. Pasturage is in fine condition. Rye, oats and barley are looking well.

*Amherst* (WM. P. BROOKS). — Wire worms, forest tent caterpillars and white grubs are doing some damage. Indian corn is in fine condition except on the driest soils; about half the crop goes into the silo. The hay crop was rather above the average in quantity and of fine quality. Corn, oats and peas, the millets, Hungarian grass are grown for forage and are generally in good condition. Potatoes have suffered more than most crops from drought and are generally suffering from blight. Apples, pears and peaches indicate fair crops; plums and quinces about average; grapes excellent. Pasturage is short and rain is needed. Rye is in excellent condition and oats average. Onions started well, but have suffered from blight and dry weather. Tobacco is growing well, but is quite uneven, much resetting being made necessary by the dry weather.

*Hatfield* (THADDEUS GRAVES). — Potato bugs are doing some damage. Corn is in good condition; few if any silos in use. There is a good crop of hay as to quality, but the quantity was much curtailed by the drought. Protracted dry weather has about ruined the potato crop. The prospect is good for all kinds of fruit. Pastures are in normal condition. Rye, oats and barley are little raised. Both tobacco and onions now promise well.

*Southampton* (C. B. LYMAN). — At present we are not troubled by insects. Corn is looking fairly well; 20 per cent of the crop is grown for ensilage. Hay is a full average crop in quantity and of excellent quality. Not a large amount of forage has been raised. Market-garden crops have given rather light yields; potatoes command good prices. Pasturage is very short on account of dry weather. Rye is a very good crop, also oats, which are mainly cut for fodder. Tobacco is coming forward very well and some have commenced topping; some damage from hail. Onions are looking finely.

*Westhampton* (LEVI BURT). — Potato bugs are doing some damage and flies are troubling stock a good deal. Corn is looking finely and there will be a good crop with rain; fully half the crop is grown for ensilage. The hay crop was above the average in quantity and of excellent quality. Oats and peas, millet and corn are grown as forage crops, and are in fine condition. Market-garden crops are not grown to any extent and potatoes are not harvested as yet. The apple crop will not be over half that of last year; very few pears, peaches, plums and quinces; grapes hang full. Pastures are dry and short. Rye, oats and barley are normal crops, but are little raised.

*Chesterfield* (HORATIO BISBEE). — Potato bugs are doing some damage. Corn made a fine growth and was never better; perhaps half the crop goes into the silo. The hay crop is a little below the

average in quantity, but is of good quality. Corn and millet are the forage crops grown and are in good condition. There will be but a light crop of apples. Pasturage is only in fair condition. The recent rains have made the prospect for the rowen crop good.

*Goshen* (ALVAN BARRUS). — Potato bugs are doing some damage. Indian corn is coming forward nicely and probably one-third the crop will be used for ensilage. The hay crop was from one-third to one-half short in quantity and of normal quality. Oats are largely grown as a forage crop, sometimes with peas. No potatoes have been harvested; garden crops are late, but otherwise in good condition. Apples are falling badly; few pears and peaches; plums light. Pastures are generally lightly stocked and therefore are in fair condition. Oats are somewhat raised, but rye and barley are little grown.

#### HAMPDEN COUNTY.

*Russell* (E. D. PARKS). — Potato bugs are doing some damage. Corn is in very good condition, and but little of the crop goes into the silo. The hay crop was about average as to both quantity and quality. Millet, oats and corn are grown as forage crops and are in excellent condition. There are but few early potatoes, but late potatoes are looking very well. There will be a fair crop of all fruits, but they will not be large. Pastures have held up remarkably well. Rye, oats and barley are average crops.

*Agawam* (J. G. BURT). — There is no serious damage from insects. Corn is in good condition and two-thirds of the crop is grown for ensilage. There was a good crop of hay of good quality. Corn and barley are the principal forage crops grown and are in good condition. Market-garden crops are good in yield and price, but late potatoes have been attacked by blight. The prospect is good for fruit, except peaches, which are light. Pasturage is short owing to dry weather. Rye, oats and barley are fully up to the average.

*West Springfield* (N. T. SMITH). — The elm-leaf beetle has destroyed the leaves on nearly all the elm trees in town. Corn is unusually promising and 60 per cent of the crop will be put into the silo. Hay is below the normal in quantity but of good quality. Corn, oats and millet are the principal forage crops grown and are in fine condition. Market-garden crops are about normal in yield and price. Potatoes are blighting and where dug the yield is light. As a whole the prospect is for a light crop of all fruits, though exceptional trees are heavily loaded. Pasturage is short on account of drought and heat. But little rye is grown, but what there is is a normal crop; oats grown for hay, good growth and no rust. Beans are suffering from anthracnose and the indications are that tomatoes will suffer from blight.

*Chicopee* (E. L. SHAW). — Elm-leaf beetles and the San José scale are doing some damage. Indian corn is a good crop and half of it will be put into the silo. There was above an average crop of hay of good

quality. Rye, wheat, peas and oats, millet, barley and corn are raised for forage and all have done well. Potatoes have blighted and do not promise well. Early apples are plenty, but late ones are not numerous; some pears and peaches; not many plums; no quinces; grapes plenty. Pasturage is in good condition. Rye, oats and barley are average crops.

*Ludlow* (CHAS. B. BENNETT). — Potato bugs are doing some damage. Indian corn is in excellent condition; about one-fourth of the crop is grown for the silo. Hay was more than an average crop in quantity and of first-class quality. Oats, corn and millet are raised for forage and all are in excellent condition. Market-garden crops all look better than usual. Apples and pears promise fair crops; peaches, plums and quinces light; grapes very heavy. Pastures are in very good condition. Rye is a very light crop and oats fair. The first part of June was dry, but since then we have had frequent showers and all crops are in excellent condition.

*Wilbraham* (HENRY M. BLISS). — Indian corn is in very good condition and about one-fifth of the crop will go into the silo. The hay crop is nearly all secured with an average yield of 85 per cent. The severe drought is injuring all crops. Market-garden crops and potatoes average 90 and 95 per cent of the normal respectively. The apple crop will be light; peaches 90 per cent; pears 75 per cent; cranberries 70 per cent. Pasturage has suffered from lack of rain. Rye and oats are fair crops.

*Hampden* (JOHN N. ISHAM). — Fall web worms have appeared and grasshoppers are eating cabbage leaves. Indian corn is holding its own well, but not growing fast, on account of dry weather. The hay crop is a little below last year in quantity, but of No. 1 quality. Corn, oats and peas, millet and Hungarian grass are the forage crops grown and all are in good condition. Garden crops are in good condition, with slightly increased prices from last year. Apples promise a fair but not large crop; other fruits good, especially grapes, which are abundant. Pasturage is getting short, but is holding out as well as could be expected. Rye was a short crop, but oats make a very good growth. The drought has had a serious effect on early and medium early potatoes, shortening the crop materially.

*Monson* (F. D. ROGERS). — Potato bugs are the only insect doing any amount of damage. Indian corn is in good condition. A good crop of hay was secured, but much of it was too ripe before harvested. Millet and corn are the principal crops grown for forage. Early potatoes are not very promising. Apples dropped badly, but there are enough left for a good crop; pears and grapes a full crop; peaches light. Pasturage is in very poor condition. Oats raised for hay have done well.

*Holland* (FRANCIS WIGHT). — The potato beetle is doing some damage. Corn is doing well and about a third of the crop will go into



the silo. Hay on old fields is about a two-thirds crop, while new seeded fields are fully up to the normal. Corn and oats are in good condition and are the principal forage crops grown. The prospect is good for apples, pears, plums, grapes and cranberries. The feed in pastures is getting poor on account of the dry weather.

### WORCESTER COUNTY.

*Dudley* (J. J. GILLES). — Insects of all kinds are as troublesome as usual and cankerworms are more than commonly prevalent. Indian corn is in good condition and two-thirds of the crop will be put into the silo. The hay crop is average in quantity and quality. Oats and peas, millet and corn are the principal forage crops grown; millet has suffered from the dry weather in some instances. Market-garden crops are average in yield and price. Apples and pears promise average crops; peaches half a crop; plums and quinces a failure; grapes and cranberries extra good. Pasturage is in fair condition. Rye, oats and barley are average crops.

*Warren* (W. E. PATRICK). — Potato bugs are doing some damage. Indian corn is doing finely; possibly one-third the crop will be put into the silo. There is a good average crop of hay of fine quality. Millet, Hungarian grass and fodder corn are raised for forage. Market-garden crops are in good condition and potatoes are looking well. There will be short yields of apples and pears; peaches promise a good crop. More rain is needed for pastures. Very little rye is raised; oats are grown for forage, but are not as good as usual.

*North Brookfield* (JOHN H. LANE). — Flies trouble cattle and there are many small grasshoppers. Indian corn was much injured by hail and is very ragged; half the crop goes into the silo. There was an 85 per cent hay crop in quantity and it was of good quality. Corn is the principal forage crop grown. Hail hurt potatoes seriously. Apples promise a 25 per cent yield; pears 10 per cent; plums 10 per cent; grapes 50 per cent; and cranberries 75 per cent. Pasturage is very short and dry.

*Oakham* (JESSE ALLEN). — Potato bugs are doing some damage. Indian corn looks well and perhaps one-fourth of the crop is grown for ensilage. There was about a two-thirds crop of hay in quantity and it is of excellent quality. Oats, corn and millet are the principal forage crops grown. Market-garden crops look well; no potatoes harvested as yet. There will be light yields of all fruits. Pastures look well, owing to frequent showers. Rye and oats made a light growth of straw, but are heading well.

*Dana* (LYMAN RANDALL). — Potato bugs are doing some damage. Corn is making rapid growth and probably forty per cent will go into the silo. The hay crop is not up to last year in quantity, but the quality is better. Corn and millet are raised for forage and are looking finely. Market-garden crops are looking well and are average in



yield and price. Apples, pears, peaches and grapes promise full crops; plums will be a small crop; cranberries were injured by frost. Pasturage is in very good condition. Rye and oats are fair crops, but the drought has cut them short.

*Petersham* (B. W. SPOONER). — There is not much complaint of insects. Corn has made a good growth; there are only two silos in town. The hay crop was a fourth off in quantity, but of better quality than usual. Millet and corn are grown as forage crops. Potatoes are almost a failure; other garden crops very good. The apple crop will be very short; pears good; no peaches; plums and quinces few; grapes light. Pastures are very short and dry and streams are failing. Oats and rye are little raised.

*Phillipston* (A. D. CLIFFORD). — Corn is looking well and three-fourths of the crop will be put into the silo. The hay crop is very light compared with other years. Peas and oats are raised for forage and hay, also barley and Hungarian grass to some extent; peas and oats have not done very well. Market-garden crops have done well so far, with prices average; no potatoes dug as yet. There will be less than one-fourth of a normal apple crop; other fruits little raised. Pastures are badly dried up. Barley is looking fairly well; oats not as good as last year; not much rye raised.

*Templeton* (LUCIEN GOVE). — Potato bugs, cabbage worms and squash bugs are present, but are not doing serious damage. Indian corn is quite good, better than last season; four-fifths of the crop is grown for ensilage. Oats, barley, Hungarian grass and millet are raised for forage; oats and barley rather light; Hungarian grass and barley promise well. Market-garden crops have made good yields, with average prices; peas light and price high. Apples are a light crop; pears fair; plums light; grapes good; apples and plums are dropping badly. Pasturage is quite poor owing to the severe drought during June and early July. Rye good; oats and barley light owing to drought.

*Ashburnham* (E. D. GIBSON). — Potato bugs are doing some damage. Corn is rather backward, but is coming along rapidly, and with plenty of rain will make a good crop. There is a three-fourths crop of hay of the finest quality. Millet and corn, with a little barley, are grown as forage crops, and are only in fair condition. Garden crops have suffered from want of rain. Apples and pears promise fair yields; no peaches, plums or quinces; grapes and cranberries fair. Pastures are very dry and short, but rain in abundance will bring good feed. Rye, oats and barley are average crops. No potatoes are ready for harvest; early ones must be a light yield and conditions must be exceptionally favorable to give a good crop of late ones.

*Fitchburg* (DR. JABEZ FISHER). — No insects are doing any damage of note. The hay crop was somewhat shorter than usual, but of good quality. Market-garden crops are below the average in both yield and

price. Apples promise a 60 per cent yield; pears 60 per cent; grapes 70 per cent; other fruits unpromising. Pasturage is suffering from lack of moisture.

*Princeton* (A. O. TYLER).—Potato bugs are doing some damage. Indian corn is in good condition and four-fifths of the crop will be used for ensilage. The quantity of the hay crop was about a third below the normal, but it was of good quality. Hungarian grass and millet are the principal forage crops, but few have been put in, because of the dry weather. The yield of early potatoes is very poor and market-garden crops are lower in price than in former years. Apples, peaches, plums and quinces will give light yields; pears and grapes abundant. Pastures are all dried up. The yield of rye, oats and barley is very light as compared with former years.

*Sterling* (HENRY S. SAWYER).—Potato bugs are doing some damage. Indian corn is half a crop. There was not quite a normal crop of hay and the dry weather injured its quality. Oats, barley, Japanese millet and corn are raised for forage. All vegetables have suffered more or less from drought; no potatoes harvested, price \$1.60 per bushel. All fruits promise well, though apples and pears have dropped considerably. Pastures are very dry and there is but little feed in them. Rye, oats and barley are about normal crops.

*Bolton* (H. F. HAYNES).—Potato bugs are doing some damage. Dry weather has injured the corn crop very much. The hay crop is about three-fourths of a normal in yield and of good quality. Millet is the principal crop raised for forage. All market-garden crops are light but bring good prices. The dry weather is having a bad effect on most fruits; pears promise best of any. Pasturage is short. Oats are a good crop, but are all cut for fodder.

*Leicester* (H. H. KINGSBURY).—Potato bugs and cabbage worms are doing some damage. Corn is of good color and making a thrifty growth; about one-fourth of the crop will be siloed. The hay crop is an average one in quantity and of good quality. Oats, barley and millet are largely raised for forage and all are growing rapidly. No potatoes have been harvested, some fields in bloom, all promise a good crop. Apples and pears will not give a large yield. Pasturage is in fair condition since the recent showers. Grains have made a fine growth, but are mostly used as forage.

*Auburn* (WM. GILBERT).—Potato bugs are doing some damage. Indian corn is looking well and about 90 per cent will be put into the silo. The quantity of the hay crop is fair with about 70 per cent of a full crop. Hungarian and Japanese millet and corn are the principal forage crops, and are doing well. Potatoes give a high yield and bring good prices. Apples are a light crop; peaches good; grapes a large crop. Pastures are short and dry. Rye and oats have done well; barley is sown for late feed.

## MIDDLESEX COUNTY.

*Hopkinton* (W. V. THOMPSON). — Elm-leaf beetles are doing some damage. Indian corn is suffering from drought and is mostly raised for ensilage. The hay crop was two-thirds of an average in quantity and of good quality. Oats are raised for forage, but are suffering from drought. Potatoes look like a failure for want of rain. Apples are dropping off because of drought; pears half a crop; few peaches; grapes a full crop. Pastures are very dry.

*Framingham* (J. S. WILLIAMS). — Potato bugs, the elm-leaf beetle and onion maggots are doing damage. The corn crop is generally looking finely, though some fields are ruined by drought; three-fourths of the crop will go into the silo. The hay crop is a normal one in quantity and of excellent quality. Corn, oats, rye, barley and millet are our forage crops and are in good condition since the rains. All market-garden crops have suffered from dry weather, including early potatoes. A fair crop of apples and pears is expected; peaches, plums and quinces will be light. The pastures are as brown as in November, but should improve with rain. Rye and oats made splendid growth as forage crops; barley is grown for late feed.

*Marlborough* (E. D. HOWE). — Elm-leaf beetles and potato bugs are doing damage. Indian corn looks remarkably well considering the dry weather; 75 per cent of all corn goes into the silo. The hay crop was nearly an average one in quantity and of good quality. Oats, millet and sweet corn are the forage crops grown, and are in fair condition. All market-garden crops are short, but not seriously scarce; prices are well maintained. Apples promise a 50 per cent crop; pears 40 per cent; peaches 75 per cent; plums 50 per cent; quinces 40 per cent; grapes 90 per cent. Pasturage is all dried up, there being practically no feed, but recent rains may start new growth. Rye, oats and barley are raised only for forage and are in fair condition.

*Stow* (GEO. W. BRADLEY). — The elm-leaf beetle, fall web worms and a few gypsy moths are doing damage. Corn is looking well, considering the dry weather; not a large proportion is grown for ensilage. There is about a two-thirds crop of hay of fair quality. Hungarian grass and Japanese millet, with some fodder corn, are grown for forage. Apples are a fair crop; pears good; other fruits not so plenty, except grapes, which are looking well. Most pastures are very dry. There is little rye or barley grown and oats are not doing as well as usual.

*Maynard* (L. H. MAYNARD). — Potato bugs, gypsy and brown-tail moths and fall web worms are doing damage. Indian corn is in good condition, but a little late; less than half will go into the silo. Hay was a short crop in most places, owing to dry weather. Hungarian grass and corn are grown to a considerable extent as forage crops and are in good condition. Market-garden crops are looking well at present and compare favorably with former years. Apples are about half a



crop; pears a good crop, also peaches, plums and quinces; grapes a full crop; cranberries about normal. Pasturage is getting short for want of rain. Rye, oats and barley are about normal as forage crops. Onions promise a full crop.

*Townsend* (G. A. WILDER). — Potato bugs are doing some damage. Indian corn is in good condition and there will be the usual proportion put into the silo. The hay crop was two-thirds of the normal in quantity and of good quality. Corn is the principal forage crop grown and is in good condition. Market-garden crops are about average in yield and price. There promises to be about an average crop of fruit. Pasturage is in poor condition. Rye, oats and barley are average crops.

*Pepperell* (W. F. DENNEN). — The potato bug and brown-tail moth are causing trouble. Corn is looking very well. The hay crop is not large in quantity, but was of good quality. Millet and corn are raised as forage crops. Market-garden crops have suffered from dry weather. There will be a light crop of fruit in this locality. Pasturage is very short and dry. There will be about two-thirds crops of rye, oats and barley.

*Billerica* (GEO. P. GREENWOOD). — Gypsy and brown-tail moths, cut worms and wire worms are doing damage. Indian corn is drying up badly. There was about a three-fourths crop of hay of good quality. Corn, Hungarian grass and millet are grown for forage. All market-garden crops are suffering from drought. There will be but little fruit of any kind except wild blueberries, which are plenty. Pastures are suffering seriously from drought. Grain crops are all in good condition.

*Concord* (WM. H. HUNT). — Brown-tail and gypsy moths and potato bugs are quite plenty. Corn is well, but suffered from the severe drought. The hay crop was considerably below the normal, owing to drought. Millet, oats and barley are grown as forage crops and are in fair condition. All crops on light land suffered from drought, potatoes especially. Apples and pears set fairly well, but have dropped somewhat; not many peaches; other fruits fair. Pasturage is about as bad as it could be. There was a fair crop of rye; oats and barley are not grown for grain, but look fairly well as forage crops. It is many years since we have had such a long-continued drought, but it is broken at last.

*Lincoln* (C. S. WHEELER). — Elm-tree beetles are doing some damage. The corn crop is not up to the average, owing to the drought. The hay crop was generally secured in good condition, but is off in quantity. Oats, Hungarian grass, millet and barley are grown for forage. Potatoes are looking well considering the drought, but none have been dug and the yield is uncertain. The prospect for all fruit is much poorer than at the time of blossoming, continued dry weather having caused much of it to drop prematurely. Pastures are badly dried up. Rye, oats and barley are average crops.



*Winchester* (S. S. SYMMES). — The elm-leaf beetle is doing some damage. Indian corn is not raised here. Hay was all secured, but was a light crop. Sweet corn is being cut to feed cows, as it failed to grow ears, owing to drought. Potatoes have dried up; prices on all market-garden crops have been lower than for years. There will be fair yields of apples and peaches; much rain is needed for fruit. Pasturage is absolutely dried up. Rye was a fair crop. The drought has been so severe that nearly all crops are ruined. A shower on the night of the 22d wet the ground about four inches deep.

*Newton* (G. L. MARCY). — Gypsy moths have a good foothold here. Indian corn is not raised and the weather has been too dry for sweet corn and silo corn. The hay crop was below the average in both quantity and quality. Corn and millet are raised for forage and their condition is much improved since the recent showers. Garden crops were nearly ruined by drought, but will improve with the rains; one man reports digging one pint of potatoes from twenty-two hills. Apples, pears, quinces and grapes promise average crops. Pastures are in poor condition, but are beginning to look green again now. Rye, oats and barley were good crops where cut before the drought. There was no rain in this section from May 30 to July 18, except very light showers.

#### ESSEX COUNTY.

*Haverhill* (EBEN WEBSTER). — Fall tent caterpillars are doing some damage. Corn is doing well since the drought was broken; most of the crop goes into the silo. The hay crop was about two-thirds of an average crop in quantity. Corn is the principal forage crop grown. Market-garden crops have given less yields than usual, but prices have been higher. Grapes are plenty; other fruits less than normal. Pasturage is in about the usual condition. We have had hot and dry weather until about two weeks ago.

*Andover* (MILO H. GOULD). — The elm-tree beetle is doing some damage. Indian corn is looking pretty well, but is rather late; all will go into the silo. The hay crop was about 80 per cent of a normal crop and was of good quality. Oats and peas, barley and Hungarian grass are the forage crops grown and are in good condition. Market-garden crops have been below the average in yield and prices have been low; potatoes are a light crop on account of drought. Apples and cranberries will give light yields; pears and peaches are looking well; grapes good. Pastures are short. There are average crops of rye, oats and barley, as they came on early enough to escape the drought.

*Hamilton* (GEO. R. DODGE). — No insects are proving especially destructive. Ninety per cent of the corn crop will be put into the silo; it is not quite as forward as usual this season. Hay was not over a two-thirds crop in quantity, but was of good quality. Oats, barley and fodder corn are the crops grown for forage and fields of sowed grain are uneven and weedy. Market-garden crops give fair promise

and potatoes are looking well. Summer and fall apples will be plentiful but undersized; baldwin apples not half a crop; other tree fruits about half a normal yield. Upland pastures are pretty well dried up and lowland pastures are short. Rye, oats and barley are not up to the normal.

*Wenham* (N. P. PERKINS). — Gypsy moths, black squash bugs, onion lice and potato bugs are doing damage. Not much corn is raised here for grain. The quality of the hay crop is good, but the yield was only about two-thirds of the normal. Corn, Hungarian grass, oats, barley are raised for forage crops. Potatoes are not more than half a crop; also other market-garden crops; prices fair. There are only light yields of fruit in prospect. Pastures are suffering very much from drought, and are now quite short. Rye, oats and barley are very little grown.

*Manchester* (JOHN BAKER). — Gypsy and brown-tail moths are doing damage. Indian corn is in good condition; none grown for the silo. The hay crop was light, but of good quality where cut early. Corn and barley are the principal forage crops grown and are in good condition. Market-garden crops are in fair condition and prices are high. The prospect is good for all kinds of fruit. Pasturage has been very dry, but is getting better now. Rye, oats and barley are good crops. Crops are looking remarkably well considering the dry weather.

*Danvers* (C. H. PRESTON). — Gypsy moths are doing some damage. Indian corn is a very poor crop on all except very moist land; nearly all the crop goes into the silo. There was two-thirds of an average hay crop of good quality. Corn and barley are raised for forage crops and are in poor condition. Market-garden crops are in poor condition and potatoes are a failure. There will be few apples; pears fair; few peaches or plums; grapes fair. Pasturage is very poor. Rye is an average crop; oats and barley fair crops.

## NORFOLK COUNTY.

*Cohasset* (ELLERY C. BATES). — No insects are doing damage at present. Indian corn is not raised here. There was a light crop of hay. Forage crops are not grown. There is a very light crop of early potatoes and all market-garden crops are below the average. There will be small yields of all fruits. Pastures are in poor condition. Rye, oats and barley are light crops. No rain fell here from June 1st to July 14th, and all early crops have been very light, some being entirely ruined.

*Westwood* (HENRY E. WEATHERBEE). — The elm-leaf beetle is doing considerable damage and the gypsy moths are scattered in all sections of the town. Corn is looking well. The hay crop was not quite as heavy as last year, but was of good quality. Fodder corn, Hungarian grass and German millet are all raised for forage and are looking well. Market-garden crops have suffered from the dry weather, but bring

better prices than usual. Apples, pears, peaches and grapes are looking well. Pastures are very short on account of the drought. Rye is a good crop; oats below average as a forage crop.

*Walpole* (EDWARD L. SHEPARD). — Potato bugs and brown-tail moths are doing some damage. Indian corn is late but is improving fast since the rain; about half the crop goes into the silo. Corn, oats and Hungarian grass are the forage crops grown and they are a little below normal in condition. Market-garden crops are improving since the rain, yield normal and prices low. There will be about an average crop of fruit. Pasturage has passed by for this year. Rye, oats and barley are about normal crops.

*Millis* (E. F. RICHARDSON). — Elm-leaf beetles are doing some damage. Corn has revived since the rains; three-fourths of the crop goes into the silo. The hay crop was a good one, both in quantity and quality. Oats and peas, millet and Hungarian grass are the forage crops grown. Market-garden crops are practically dried up. There will be a small crop of the various fruits. Pastures are dry and brown. Rye, oats and barley are normal crops.

*Bellingham* (JOHN J. O'SULLIVAN). — The elm-leaf beetle and potato bugs are doing damage. Indian corn is in good condition; ten per cent of the crop goes into the silo. The hay crop was fair in quantity and of good quality. Japanese millet, Hungarian grass and corn are the forage crops grown. Market-garden crops are in poor condition on account of dry weather; yield of potatoes medium and price as usual. Apples, plums, quinces and grapes promise fair crops, while pears, peaches and cranberries will be poor. Pasturage is all dried up. Rye, oats and barley are about average crops.

*Franklin* (C. M. ALLEN). — Elm-leaf beetles are doing damage. Indian corn looks well and most of it will be fed to stock one way or another. There is an average crop of hay, but less than last year. Market-garden crops are light in yield, but bring high prices. Fruits of all kinds look well. Pasturage is very poor, all dried up. There is an average crop of rye, oats and barley.

## BRISTOL COUNTY.

*Mansfield* (WM. C. WINTER). — Potato bugs and currant worms are doing some damage and elm-leaf beetles are reported as beginning to appear. Indian corn is generally looking well; not much is grown for ensilage. The hay crop was normal on low ground and somewhat below on high ground, with the quality good. The ground has been so dry that no forage crops have been put in; sweet corn and Hungarian grass are the usual crops grown. Market-garden crops are in good condition; potatoes looking fair, none harvested; prices about normal. Summer and fall apples plenty, winter apples a light crop; pears a full crop; peaches, plums and quinces light; grapes good; cranberries



doubtful. Pasturage is very poor at the present writing. Rye, oats and barley are but little grown.

*Attleborough* (ISAAC ALGER). — Elm-leaf beetles are doing damage. Indian corn is in very good condition; about half the crop goes into the silo. The hay crop is about average in quantity and quality. Millet and corn are the forage crops grown and are in excellent condition. The outlook for potatoes is good. All kinds of fruit in this section indicate a small crop. Pastures are very short, but the showers of the last ten days will improve them. Rye, oats and barley are about average crops. More than 4 inches of rain has fallen in the last ten days and the ground is now well soaked.

*Seekonk* (JOHN W. PEACK). — There is no damage from insects in this locality. Corn is little raised except for silo or forage. The hay crop is nearly up to the average for quantity and quality, but the meadows were burned after the crop was secured. Oats, barley and Hungarian grass are raised for forage. The yield of market-garden crops has been good, but prices have been low, except for potatoes. Pears look well; apples not as plenty; fruits fair as a whole. Abundant rains within a few days have improved pastures. Rye, oats and barley suffered from drought.

*Dighton* (HOWARD C. BRIGGS). — Elm-leaf beetles are doing some damage. Indian corn is a fair crop and 25 per cent will go into the silo. The hay crop was below the normal in yield but of good quality. Fodder corn, millet and oats are raised as forage crops and are in poor condition. Market-garden crops are fair, but not up to the average in price or yield. The prospect is good for all kinds of fruit. Pasturage is in poor condition. Rye, oats and barley are average crops.

*Swansea* (F. G. ARNOLD). — Elm-leaf beetles are doing a good deal of damage. Corn is in good condition; there is but one silo in town. The hay crop was much lighter than usual, but of fine quality. Millet, fodder corn and barley are grown for forage and are looking well. Dry weather in June and early July ruined many fields of potatoes, prices fair; other market-garden crops good and prices low. There are few apples or pears; peaches plenty; grapes plenty; no cranberries. Pastures were very dry until the recent rains. Oats are a heavy crop and rye a good crop.

*Acushnet* (M. S. DOUGLAS). — Elm-leaf beetles are doing some damage. Corn is below normal on account of drought; very little is raised for ensilage. The hay crop was about three-fourths of the normal and of good quality. No forage crops have been planted because of lack of rain. All garden crops are drying up; potatoes half a crop. All fruit dropped badly and some fall apples are now being marketed, three weeks earlier than ever before. Pasturage is all dried up. Rye was a good crop and oats a two-thirds crop. It has been many years since we have had such a drought so early in the season.



## PLYMOUTH COUNTY.

*Marshfield* (JOHN H. BOURNE). — Potato bugs, cut worms and squash bugs are doing damage. The dry weather has hurt the prospect for the corn crop, but a good yield is promised on low land. The hay crop was 80 per cent of a normal crop in quantity and of excellent quality. Oats and peas are grown as forage crops, but corn is the main reliance. Potatoes are a very small crop, with prices higher than usual. Apples are a good crop, but small in size, and many are dropping off. Pasturage is very poor, owing to dry weather. I have seen but one field of rye and that was in good condition.

*Hanover* (HARRISON L. HOUSE). — The elm-leaf beetle is doing the most noticeable amount of damage. Indian corn is in fair condition; practically none will be put into the silo. The hay crop was about normal in quantity and quality. Oats and Hungarian grass are raised for forage and are in good condition. Market-garden crops are generally good, but potatoes are a short crop; prices about normal. Apples, pears, plums and cranberries promise good yields; peaches fair; grapes extra good. Pasturage is in fair condition, though badly dried up in some places. Rye, oats and barley are not raised for grain, but seem to be in good condition as forage crops.

*Hanson* (FLAVEL S. THOMAS, M. D.). — Indian corn is in poor condition; no silos in town. There was an average crop of hay, two-thirds as much as last year. Corn is the principal forage crop grown and is in poor condition. Gardens are late on account of drought and not much has been obtained from them as yet. Apples, pears, peaches and grapes promise good crops, though apples are small in size. Pasturage is poor on account of drought, but will improve with recent rains. Rye, oats and barley are but little raised.

*Plympton* (WINTHROP FILLEBROWN). — Potato bugs are doing some damage. In some localities Indian corn has suffered from drought, while other fields show good color. The hay crop is about 70 per cent of the normal in quantity. Corn fodder is used almost exclusively for a forage crop, with some Hungarian grass. Potatoes are far behind former years; prices a little higher than usual. Pasturage was on the go until the recent showers. The long drought came very near ruining all crops.

*Bridgewater* (ROWLAND CASS). — Potato bugs, squash bugs and cabbage maggots and worms are doing damage. Corn is in thrifty condition; none grown for the silo. The hay crop was about normal in quantity and quality. Corn, millet and barley are raised as forage crops. Market-garden crops are in fair condition, yield smaller than usual with prices about normal; early potatoes will be about half a crop except on low land. Apples are in fair condition; pears good; no other tree fruits grown for the market. Pasturage is in poor condition. Rye was about a two-thirds crop as to both grain and straw; oats and barley not grown for grain.

*Lakeville* (NATHANIEL G. STAPLES). — The elm-leaf beetle is quite plenty. Corn is looking well; practically none of the crop is grown for ensilage. The hay crop was from 15 to 20 per cent below the normal, but of very good quality. Fodder corn, Japanese millet, oats and barley are the forage crops grown. Garden truck is looking well now and potatoes never looked better; prices have been good. The season has been very dry until within a week and pastures are all dried up. Rye, oats and barley are about average crops. Crops looked well until the first of the month, when the drought began to tell on them, but have improved since the recent rains. We had no rain to speak of since April until the 14th of July.

*Mattapoisett* (E. C. STETSON). — The elm-leaf beetle is doing some damage. Corn is looking quite well, especially that planted early; very few silos in this section. The quantity of the hay crop was a little below average, but the quality was good. Fodder corn, millet, beets and carrots are raised as forage, and are in good condition. Garden crops have suffered much from drought; prices about average. Almost all fruits and berries are looking well. Rye, oats and barley are about average crops.

#### BARNSTABLE COUNTY.

*Bourne* (DAVID D. NYE). — Gypsy moths and potato bugs are doing damage. Indian corn is looking fairly well; none raised for the silo. The hay crop was not over half a normal crop in quantity, but was of fair quality. Oats, rye and corn are grown as forage crops. Market-garden crops are looking fairly well; early potatoes are of fair size; late potatoes need rain. The prospect is that the fruit crop will be small, not much fruit raised; cranberries are suffering from drought. Pasturage is poor and dried up. Rye, oats and barley are good crops, but are little raised. Not much farming is done here, the people are mostly mechanics.

*Mashpee* (W. F. HAMMOND). — Potato bugs and cranberry worms are doing damage. Indian corn is about an average crop and none will be used for ensilage. There was about half a crop of hay of good quality. Oats and corn are the principal forage crops grown. Market-garden crops are about an average in yield and price. Apples and pears promise only half yields; grapes and cranberries two-thirds. Pasturage is below the average in condition. Rye and oats are about two-thirds crops for grain and about average as forage crops.

*Barnstable* (JOHN BURSLEY). — Green-headed flies are troubling stock severely. Corn is growing rapidly; none raised for the silo. There was a three-fourths crop of hay of fine quality. The ground has been so dry that no forage crops have been sown. The drought has hurt all garden crops very much. There will be a few apples and pears; peaches and plums very small; grapes good; cranberries fair, though injured by dry weather. Pasturage is practically all dried up.

Rye was a light crop; oats are an average crop, and are all cut for forage; very little barley grown.

*Brewster* (THOS. D. SEARS). — Potato bugs and cranberry worms are doing some damage. Corn is in good condition and fully one-half the crop will be put into the silo. The hay crop was of good quality, but not more than half that of last year in quantity. Corn and oats are the principal forage crops and are in fine condition. Market-garden crops are in poor condition and prices are somewhat higher than in former years. The prospect for apples, peaches, cranberries, etc., is poor, owing to the dry season. Pastures are in very poor condition. Rye, oats and barley do not compare favorably with former years, either as grain or forage crops. The season thus far has been a hard one for farmers, owing to the drought, and their crops will be light.

*Orleans* (FREEMAN E. SNOW). — The elm-leaf beetle is making havoc with the shade trees. Indian corn is looking well, but has been kept back by the dry weather; no silos in this vicinity. The hay crop was short on account of drought. Corn is raised for fall feeding and oats are raised to be cut and cured as hay. Potatoes are doing fairly well in spite of the ravages of potato bugs. Fruit is looking well and cranberries seem to promise a fair crop. Pastures have suffered from the drought, but have been helped by recent rains.

*Truro* (JOHN B. DYER). — There are no new insects doing damage. There are no silos hereabouts; the long period of dry weather has injured all upland vegetation. Fresh hay was a fair crop on low land. A little corn fodder is grown as a forage crop. On dry land gardens are nearly a failure because of dry weather. The prospect for fruit is better than last year, and the prospect is encouraging since the rains. Pastures are very dry. Rye, oats and barley are short crops. The cranberry crop promised well, but the dry weather injured a good deal of bog on dry parts. Poultry raisers are suffering from the depredations of hawks.

#### DUKES COUNTY.

*West Tisbury* (GEO. HUNT LUCE). — Potato bugs and cranberry fire worms are doing damage. Indian corn looks much better than one would expect, considering the very dry weather, but needs rain. There was about half a normal crop of hay of fair quality. Corn is the only forage crop grown and is in fair condition. Early potatoes gave a poor yield and late ones are a failure; prices are high. Fruit is dropping badly, and unless rain comes soon there will be a very poor crop. Pastures are very dry, and some farmers are feeding from their barns. Rye, oats and barley are about two-thirds crops.



# BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

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## DRAINAGE.

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By Prof. WM. P. BROOKS, *Director of Massachusetts Agricultural Experiment Station.*

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There is a great field for the profitable investment of capital in the drainage of land either at present entirely unproductive, or producing far lower returns than it is capable of because of faulty conditions as affecting the supply of water. It is not as generally recognized as it should be that the returns in agriculture are controlled in a large degree by the physical conditions in the soil, as affecting especially the water supply and its temperature. Everybody knows that a field where water stands during any part of the growing season needs drainage, but it is not so generally understood that the productive capacity of many other fields would be greatly increased by the establishment of better drainage conditions. It is essential for the healthy growth of practically all the cultivated crops of the field, garden and orchard, as well as for our most valuable grasses and clovers, that the soil area occupied by the roots should contain air as well as water.

On going downwards in any field we reach a point below which water occupies all the spaces between the soil particles. In this part of the soil the water is relatively stagnant, and it is impossible for the roots of most of our valuable plants to maintain themselves in that portion of the soil thus filled with water. It is customary to designate the water which thus stands between the soil particles as hydrostatic water; and the surface of this body of hydrostatic water, the level of which would be determined by sinking holes sufficiently deep to reach it in various parts of the field, is usually designated the water table.

Above the water table the existing condition is quite different. The soil contains some air between its particles, while the particles themselves are surrounded by films of water which are held by capillary attraction and surface tension. It is customary to designate the water thus held on and between the particles of soil as capillary water.

The capillary water of the soil may be derived in a considerable



measure from the rains and melting snows, a part of which is held as the water sinks through the soil by the forces which have been referred to, but especially in seasons of prolonged absence of rain is this water drawn by capillary attraction from the body of hydrostatic water below. Just as oil is drawn through the wick to feed the flame, so water is drawn from the great reservoir of hydrostatic water below (the soil above the water table serving as the wick) to supply the loss near the surface, due to exposure to sun and wind and to the demands of vegetation.

The amount of capillary water in that portion of the soil which lies above the water table will vary in all cases with the distance above the water table. That part of the soil which lies close to the water table contains relatively large amounts of water, while the proportion, supposing the character of the soil to remain uniform, gradually decreases as the distance above the water table increases, or as the surface is approached.

The proportion of capillary water in the soil which is desirable varies to a considerable extent in the case of different plants, but, as a general rule, it may be stated that in the immediate vicinity of the water table, in soils of fine texture, at least, the proportion of water will be too great for the best activity of the roots of most plants. It is only when a point lying at a distance of from one to two feet above the water table in most soils is reached that we find the most favorable proportions of water and air for the root development and activity of most plants. This fact, as will be pointed out later, has an important bearing upon the proper depth of drains.

#### SPECIAL REASONS FOR THE IMPORTANCE OF DRAINAGE IN MASSACHUSETTS.

The owner of land or the capitalist looking for investment must naturally carefully consider the question of probable returns on money invested in drainage. It is the belief of the writer that money thus used will prove not only one of the safest, but also one of the most profitable, investments in many cases. Space will not allow a full discussion of the subject, but the following are among the more important of the points to be taken into consideration.

1. The soils which are in need of drainage are in general of much greater fertility than the average soils of the State. The low lands especially come under this class, for from time immemorial they have received the wash of the higher lands, and they have, moreover, in many cases been enriched by the gradual accumulation of organic matter. It follows, therefore, that these low lands, if relieved of surplus water, become not only good farm lands, but that their value for farm and garden purposes will be much greater than that of much of our upland. The necessity for drainage, however, is not confined to the low lands. There are many elevated tracks of land, and es-

pecially many hillsides, requiring drainage for the establishment of more profitable agriculture. In a great majority of instances the soils in such localities are of strong retentive character and if relieved of surplus water increase in value for agriculture.

2. Massachusetts possesses a very large area of swamp and marsh land, — in many cases extremely well located as regards facilities for market and for transportation to market. To drain our most extensive swamps and marshes in a satisfactory way will require a careful study of the situation and the adoption of comprehensive and carefully considered plans. It will be necessary, therefore, for the numerous small holders to work together co-operatively, or that the small holdings be united, in order that the new improvements can be economically carried out.

3. Besides these swamp areas, probably there exist almost all over the State places in many of the fields now under cultivation where the product is inferior both as regards quality and quantity, on account of imperfect drainage. In these relatively unproductive portions of fields already under cultivation, the work of drainage should in many cases begin.

4. The markets of Massachusetts are probably unsurpassed in any part of the world; certainly they are unsurpassed in any part of this country. There can be no doubt, therefore, that the product of the wide areas at present unproductive will find a profitable market.

#### THE BENEFICIAL EFFECTS OF DRAINAGE.

The principal benefits following the drainage of land suffering from excess of water may be stated as follows: —

1. It deepens the soil. As has been stated, only that portion of the soil is accessible to the roots of most of our valuable plants which lies above the water table. If the average depth of the water table below the surface of the ground during the growing season is two feet, the total mass of soil through which the roots extend and on which they can feed is only one-half as great as it would be if the average level of the water table is four feet below the surface. Reducing the level of the water table in one sense, therefore, enlarges the farm. True, the soil at the lower levels may not be equally rich in the elements of plant food with that nearer the surface, but its contribution in that direction is nevertheless important. Some of the readers of this paper may ask the question whether the roots of our ordinary plants will penetrate to the lower soil levels rendered available by drainage. Upon this point the writer has not the slightest doubt. The roots of most of our common crops penetrate far more deeply than is generally supposed, and there are probably few if any among the common cultivated crops that will not send roots to a depth of at least four feet, provided the soil conditions are favorable.

2. Drainage promotes more perfect aeration. The air cannot pene-

trate a water-logged soil. The action of the oxygen of the air upon the various soil constituents is favorable in several important directions.

(a) It promotes oxidation, and gradually renders soluble and available numerous soil compounds which but for this action must remain inaccessible to the growing crop.

(b) Only in well aerated soil do the organisms whose activity is essential to the formation of nitrates flourish.

(c) Well aerated soils are favorable to the multiplication and activity of numerous other beneficial micro-organisms whose activity increases the productive capacity.

(d) The living root itself can maintain a condition of healthy activity only where the soil contains air as well as water.

3. The average temperature of the soil through the growing season is raised by drainage, and the growing season itself is practically lengthened, because rapid growth will begin earlier in the spring and continue later in the autumn.

4. Better tillage becomes possible; a wet soil cannot be brought into satisfactory tilth.

5. The probability of injury to growing crops in periods of drought is reduced. This statement may at first thought seem to be a paradox. The reader may be inclined to say that it seems unreasonable that damage from drought should be reduced by relieving the soil from surplus water. The fact, however, is unquestioned. The effect appears to be due principally to the following causes:—

(a) The water table being reduced, roots penetrate to levels further removed from the surface and therefore retaining water more effectually in periods of intense heat and drought.

(b) The physical condition of the soil above the water table is modified and improved. Its capillary qualities are increased. It conducts water from the great reservoir below more effectively.

(c) The feeding rootlets range more widely and deeply and are in a position, therefore, to draw moisture from a much larger soil area than on undrained fields.

6. Seeds germinate more certainly and perfectly.

7. The probability of surface wash is reduced, for the water of heavy rains and melting snows is free to settle into the soil instead of running off over the surface.

8. The sanitary conditions are improved.

#### INDICATIONS OF DESIRABILITY OF DRAINAGE.

It will be apparent to all that in all cases where, under ordinary conditions, water stands on the surface of the ground for any length of time, except of course when it may be frozen in winter, drainage is essential. It will, however, prove highly beneficial in many localities where it seldom or never stands at the surface. The character of the natural vegetation affords clear indications. In all places where



sedges, rushes and water grasses flourish it is certain that drainage will be beneficial. The writer advises determining the average level of the water table in all cases where there is doubt. This is easily done by sinking holes in various parts of the field in question. The height of the water in these holes indicates the level of the water table, and if this, during the growing season, is found to be less than three and one-half to four feet from the surface during considerable periods of time, it is certain that the agricultural value of the field would be increased by thorough drainage.

#### KINDS OF DRAINS.

Doubtless the first form of drain constructed by man was the open ditch. Such ditches are in many cases still in use. The open ditch as a channel for rapidly carrying off surface water is frequently desirable, but as a means of thorough drainage is highly unsatisfactory. The principal reasons are as follows:—

1. The cost of construction is heavy. The sides must be sloped in order that the ditch be reasonably permanent. The amount of earth which must be removed is much greater than for under-drains of the same depth.

2. The cost of maintaining an open ditch is high. In many cases the banks cave or wash and vegetation gradually obstructs the channel. The open ditch to be satisfactory requires frequent attention.

3. The open ditch requires too much land and is an obstruction to farm operations.

#### *Underdrains.*

All of the different kinds of underdrains are free from many of the faults which have been named in discussing the open ditch, and all of them, therefore, have important advantages in operations designed for the thorough drainage of land over open ditches. They are by no means all of equal merit. The principal types of underdrains worthy of consideration are the following: pole, box, stone and tile.

*Pole and Box Drains.*—Both of these types of drains if properly put in will do effective work for a time, but both are open to one serious objection, — the material used in their construction is perishable. The principal item of cost in all of the different types of underdrains is labor. It is therefore, in general, bad policy to employ in the construction of drains any material which is perishable simply because it costs less than something which is permanent. The pole or box drain will last but a relatively short time on account of the decay of the wood. The methods of constructing these drains, therefore, will not be given.

*Stone Drains.*—The material used in the construction of these drains is practically imperishable. In this respect, therefore, these drains equal tile drains. In other important particulars, however, they are inferior. The following are the principal points:—



1. As stones are more bulky in proportion to efficiency than tiles, the ditches to receive them must be larger.

2. If a regular conduit is built by the use of stones more labor is required than in laying tiles.

3. It is not possible with such stones as are usually available to build a conduit which will have sufficiently close joints to effectively exclude sand and silt. Stone drains are, therefore, more likely to become clogged in most soils than tile drains.

4. Because of the nature of the material used the stone drain inevitably presents rougher surfaces to the passage of water, and any obstructions which enter the drain are therefore more likely to remain in it.

Because of these reasons it is not believed that it will usually be wise to put in stone drains. The only saving is the outlay required for the purchase of the tiles, but this saving will in most cases be much more than offset by the extra costs of putting in which have been referred to. Stone drains will prove most durable in soils of heavy and compact character, because in these soils they will be less likely to fill with silt and sand. In such soils, where stones of suitable character are available for drain construction, it may possibly sometimes pay to put in stone drains, although even this is open to question.

*Tile Drains.* — Drainage by means of tile made especially for the purpose is practically the only system of thorough underdrainage that can in most cases be advised. Tile drains are better than drains of any other kind for many reasons, most prominent among which are the following: —

1. On account of their regular form they offer a smoother and more uniform conduit for water, and are, therefore, less liable to obstruction than drains made of any other material.

2. Closer joints can be made than in most other kinds of underdrains, and the probability of entrance of silt and fine sand is therefore less.

3. The material is practically imperishable if placed below the reach of frost.

#### KINDS OF TILES.

Numerous forms of drain tiles are offered in our market. It is believed that choice will lie between two of these, viz., the round, and the six or eight sided. In both of these kinds of tile the bore is round, and if made of equally good clay and well burned there is probably no great difference between them in respect to cost, convenience of laying and durability. As found in our markets, however, the six or eight sided tiles appear to be lighter in proportion to capacity than the round. This, of course, is an advantage in connection with transportation. It might be thought that the six and eight sided tiles, having flat faces, may be more conveniently laid than the round, which when placed upon a flat surface are more likely to roll. A highly convenient

method, however, of preparing the bottom of a ditch for tiles is the cutting of a half-circle groove. Only this groove, which is to receive the round tile, needs to be graded with care and absolute exactness, and if the round tile be laid in such a groove the difficulty referred to is not experienced. Whatever the kind of tile selected the individual pieces should be straight, and the ends should be as square and true as possible. The tile should be hard-burned.

Both glazed and unglazed tile are offered in our markets. The latter, if well burned and of good workmanship, should make excellent drains, but glazing is likely to improve the tile in two directions. It makes the surface over which the water must move smoother, so that friction is reduced, thus giving greater capacity for carrying water for a given size, and the tile must prove somewhat more durable.

### SPECIAL FORMS OF TILES FOR PARTICULAR USES.

There are a number of special forms of tiles for different uses. Among the more important are curves, enlarging tiles and junction or branch tiles.

#### *Curves.*

In ordinary land-drainage operations these are seldom necessary, but if for any reason the line of the drain must make relatively sharp turns, the work is more secure if the turn is made by the use of a curve of suitable character. It is a matter of some difficulty to make turns in lines of drains with straight tiles, and at the same time make the joints between abutting tiles sufficiently close to effectively exclude sand and silt.

#### *Enlarging Tiles.*

The enlarging tile is one that tapers, and such tiles are used when on any given line of drain a change is made from a smaller to a larger size.

#### *Junction or Branch Tiles.*

Such tiles are useful in making connections between lateral or branch drains and a main drain. Both Y and T branches are manufactured. The former are in most cases to be preferred. In order to procure when ordering the kind of Y needed the figure designating the diameter of the main drain should be placed first and connected by the sign of multiplication with the figure indicating the diameter of the lateral or branch tile which is to be united with the drain. For example, if a 2-inch branch is to be connected with a 4-inch main drain the order should read "1 Y, 4 by 2."

#### *Collars.*

Manufacturers of round tiles usually offer short sections for use at the junctions under the name of collars. Collars are usually about 2 or 3 inches long. The collar needed in any case is a short section of tile just large enough to allow the insertion of the abutting ends of the tiles which are being laid. Such collars somewhat increase the security

of the drain, as they reduce the chances that the tiles will get out of alignment. Their use, however, greatly increases the cost, and they are not ordinarily required.

#### HOW WATER ENTERS UNDERDRAINS.

Two misconceptions as to the manner in which water enters underdrains appear to be not uncommon.

1. There is a general idea that special provision for the entrance of water must be made, like that, for example, between stones in drains of that type, or that, in the case of tile drains, the tile should be porous in order that water may find its way through.

2. It is thought that water runs down from above into the underdrain.

As a matter of fact the underdrain is brought into action only when some portion of the channel for water is below the water table in the soil. However rapidly water is carried into the soil, the underdrain will not run until the level of the hydrostatic water in the soil rises above the bottom of the channel which the drain affords. As the hydrostatic water rises above the drains, the water, by its natural hydrostatic pressure, is forced into the channel afforded by the drain. The pressure increases of course as the water rises, and before it has risen much above the channel it is sufficiently great so that, practically speaking, however impervious the tile, or however close the joints (if laid without mortar), it is impossible to keep the water out.

In putting in underdrains we have not to consider in the case of either tiles or stones the provision of openings through which the water will enter; on the contrary, we must use every care to make all joints just as close as possible. The danger is not that the water will be prevented from entering, but that foreign substances (fine sand and silt) will gain entrance and thus obstruct the drain.

#### THE LOCATION OF DRAINS.

The location of drains in a field requiring drainage should in all cases receive special and careful attention and study. It is not possible to lay down general rules which will prove of much value. In the case of large operations there must usually be a principal or main line and subordinate branch lines of drains. The principal drains are usually spoken of as mains, and these will naturally run through the lowest part of the area to be drained, while with both mains and submains, branch lines, which are usually spoken of as laterals, will be connected. In planning a system of underdrainage it seems to be wise to provide for a system with relatively few outlets into open water courses. Thus, for example, if we have a field with a principal channel running through it somewhere near the middle, and the land on either side slopes gradually towards this channel, the system will be most satisfactory if a main drain is put through the principal channel, and the



laterals connected with it, only one outlet being provided for the entire system, which, of course, should be at the lower end of the main. In such a case good drainage might be secured by putting a deep open ditch through the principal hollow, and making the laterals discharge directly into this; but while this system will cost less than the other, because the larger sizes of tiles needed for drains are relatively costly, it is not believed that it will prove equally satisfactory in the end, because the open ditch is liable to numerous accidental injuries (previously referred to) which may lead to the obstruction of some of the laterals. It will be much easier to watch and maintain in perfect condition the one outlet into an open water course on the main than to watch and keep in perfect condition the numerous outlets required if the laterals discharge directly into an open ditch.

#### DIRECTION OF DRAINS.

The proper direction of drains is determined by the slope. In all cases where the area to be drained is relatively level, it is necessary, in order to secure a satisfactory grade, to run the drains in the direction of the line of greatest slope. In the case of springy slopes, or slopes where water passing through the soil tends to continually crop out at the surface, running the drains obliquely down the slope is generally regarded as the best plan. In this direction they effectively cut off the water which is seeping through the soil toward the bottom of the slope, while at the same time they have a sufficient grade to carry the water away rapidly.

Laterals should as a rule run about at right angles with the main with which they are connected.

#### PROPER DISTANCES BETWEEN DRAINS.

This will vary with the character of the soil. Laterals must be nearer together in proportion as the soil is compact and relatively impervious to water. In a field underdrained by parallel lines of tiles, the usual level of the water table along the lines of tiles will be the level of the bottom of the conduit which they afford, but as the distance in the direction of a right angle from the line of tiles increases, the level of the water table rises above the level of the conduit. The water table will be highest between any two lines of tiles along the line midway between them. The rate at which the water table rises is greater in proportion as the soil is compact. In a soil of open character the rate of rise is slight, and lines of tiles which are relatively far apart will hold the water table midway between any two lines at a level sufficiently below the surface of the ground. In a compact soil, on the other hand, the rate of rise of the water table is so rapid that should tiles be placed equally far apart the water would stand much too near the surface, perhaps at the surface should the lines be placed equally far apart. In soils of the most compact character it is necessary,



therefore, for the thorough drainage of soils naturally excessively wet, to place lines of tiles, which are not less than about 3 feet deep, at distances not greater than about 20 to 25 feet apart; 40 to 50 feet between lines is usually satisfactory.

In the statements which have been made concerning the distance between different lines of drains reference has been made to the drainage of areas where soil and water conditions are uniform in character. There are, of course, many fields with varying soil and water conditions, in which uniform spacing of the lines of tiles is not advisable. Under these conditions each field is a special problem in itself.

The distance between drains which will give satisfactory results will be influenced much by the depth of the drains. The deeper these are the farther apart the lines may be. In compact clays a fairly safe rule is to place the lines 6 or 7 feet apart for each foot of depth in the drain, while in loams the distance may vary at double this rate. That is, it may be from 12 to 14 feet for each foot of depth.

#### THE PROPER DEPTH OF DRAINS.

The depth to which drains can be placed is in some instances determined by the level of the water in the open channel into which the tiles must eventually discharge. Where this level is relatively close to the surface, the question will sometimes arise with how little depth may fairly satisfactory results in drainage be anticipated. In the writer's judgment it will not be advisable to put in underdrains unless the depth possible is equal to at least  $2\frac{1}{2}$  feet from the surface. Here and there for short distances the tile may be laid at less depth, but it will not be safe, from the action of the frosts, at less than the depth indicated.

In all cases where conditions permit it seems best to place underdrains at the average depth of from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  feet below the surface. At this depth drainage in the case of compact clays and hardpans may be relatively slow at first, but later the soil will gradually become more open and porous under the influence of root action, the tunneling of earth worms and the formation of cracks as the soil dries out, so that, in the course of a relatively short time, the drainage of even clays is sufficiently rapid with underdrains at the depth indicated.

#### THE PROPER GRADE.

In the case of fields which are relatively mellow it is necessary to consider with how small a grade satisfactory drainage can be secured. Experience indicates that with very careful work satisfactory drainage is secured with grades not exceeding 3 inches in 100 feet; indeed, engineers often put in drains with less grade than this. To put in drains which will work satisfactorily with so flat a grade requires extremely careful work, and with the kind of labor usually available on the farm, even under the careful oversight of the owner, who in most

cases will have little experience in this kind of work, a steeper grade will be much safer. With ordinary skill and care excellent work can be done with grades ranging from 3 to 5 or 6 inches to each 100 feet. Whatever the grade, much care should be taken to make it as uniform as possible.

#### THE SIZE OF TILE TO LAY.

The amount of water carried by tile of any given size varies with the grade. The area of the circle which measures the bore varies with the square of the diameter. It may appear, therefore, that at a uniform grade the application of this rule will indicate the relative capacity of different sizes to carry water. Thus, for example, it might be supposed that the 3-inch tile would carry two and one-quarter times as much water as the 2-inch tile because the square of 3 is 9, and 9 is two and one-quarter times 4, which is the square of 2. As a matter of fact, the 3-inch tile will carry more than two and one-quarter times as much water as the 2-inch, because the amount of friction is relatively greater in the smaller sizes. Friction being taken into account, tiles of different sizes, according to Wheeler,<sup>1</sup> have about the following relative capacity to carry water, as compared with 2-inch tile taken as a basis of comparison: —

2½-inch tile	1.5 times the water carried by 2-inch tile.
3 -inch tile	2.5 times the water carried by 2-inch tile.
4 -inch tile	5.0 times the water carried by 2-inch tile.
5 -inch tile	7.5 times the water carried by 2-inch tile.
6 -inch tile	12.5 times the water carried by 2-inch tile.
8 -inch tile	25.0 times the water carried by 2-inch tile.

(a) *Size for Laterals.* — Throughout the eastern States 2-inch tile is most commonly used for laterals, but in the middle and western States larger tiles are usually employed. Chamberlain says: —

The tendency toward larger size, especially in the rather level prairies of the west, is manifest and wise. The soil is more porous, and hence laterals may be much farther apart, and wisely laid deeper (even 4 or 4½ feet), than in our more compact, clayey soils in Ohio. Also, as the grades there are less, the sizes must be larger. . . . In Illinois 3 and 4 inch tiles are now the smallest sizes found at most tile kilns. The material is not expensive, and the tendency toward large sizes is wise, except where freights or long hauling make the weight important.

(b) *Size needed for Mains.* — Chamberlain has given rules for the size of mains in tile drainage which appear to be worth stating. According to his rule, to determine the number of acres that can be drained by tiles of different sizes when the grade is not more than 3 inches in 100 feet: square the diameter of the tile and divide the result by 4. It will be found that the areas drained by different sized mains according to this rule will be as follows: —

3-inch tile,	.	.	.	2¼ acres.		5-inch tile,	.	.	.	6¼ acres.
4-inch tile,	.	.	.	4 acres.		6-inch tile,	.	.	.	9 acres.

<sup>1</sup> Hints on Land Drainage, Agriculture of Massachusetts, 1895.

When the grade exceeds 3 inches in 100 feet the diameter should be squared and the result divided by 3. This gives the following results:—

3-inch tile, . . . . .	3 acres.	6-inch tile, . . . . .	12 acres.
4-inch tile, . . . . .	$5\frac{1}{3}$ acres.	8-inch tile, . . . . .	$21\frac{1}{3}$ acres.
5-inch tile, . . . . .	$8\frac{1}{3}$ acres.		

Wheeler has given rules which accord closely with the rules given by Chamberlain.

(c) *Method of Determining Area.* — Wheeler, however, has pointed out that owing to the fact that water more slowly finds its way to the drains in compact soils, the area satisfactorily served by a main of any given size is greater in such soils than in those of more open character.

#### LAYING OUT AND CONSTRUCTION OF DRAINS.

In all cases where the grade must be flat it will be wise to employ the services of an engineer with accurate leveling instruments. Such services will cost something, but the expense of expert services would be amply justified in the more accurate and better work which can be done. At the outset, beginning where the main drain will discharge into the open water course, stakes should be put in at each end of each line of drains, and at all intermediate points where the direction or grade changes. Beside each stake drive a grade peg or hub, level with the surface of the ground. On each of the reference stakes first driven mark the depth at which the drain is to be laid below the top of the grade peg. When ready to begin excavation drive a pair of stakes, one on either side of each peg and a sufficient distance apart to clear the ditch when it is opened. Across each pair of stakes nail a batter board, the top of which should be at some uniform distance above the proper grade at the bottom of the ditch, — 6 feet is a convenient distance. For example, if the figure on a given reference stake indicates that the ditch is to be excavated 3.8 feet at that point, the top of the batter board should be  $6 - 3.8$ , or 2.2 feet above the top of the hub. If the figure on the reference stake is 4.2 feet, then the height of the top of the batter board should be 1.8 feet above the top of the hub. When the batter boards along any given line are placed the excavation may begin. It is best in almost all cases to begin at the outlet or lower end of the line, and in most cases it is best to begin laying the tiles also at the lower end. A convenient means of determining whether the ditch is just the proper depth at any point is to stretch a light and very strong cord over the tops of the batter boards, immediately above what will be the center of the bottom of the ditch. The workman who finishes the grading should be provided with a measuring rod 6 feet in length, and should excavate until the distance from the cord above his head to the bottom of the ditch is exactly 6 feet at every point. There is one rather serious danger connected with the use of such a cord. It may sag between supports. It is necessary to take the utmost care to see that it is perfectly taut and in the true line of grade.



If in excavating the ditch earth of different grades is found, it will be best to throw that which is coarsest by itself, as such earth is best suited to fill immediately around and above the tile. In clay sands or soils made up very largely of silt and extremely fine sand, it will often be profitable, if the distance which it must be carted is not too great, to haul coarse sand or fine gravel in order to fill in immediately about and above the tiles. If soil made up either of quicksand or fine silt be placed next the tiles it is almost certain to wash in at the joints. In all cases where the bottom is quicksand, or soft and treacherous in character, it will be best to place slabs or boards in the bottom of the ditch and to lay the tiles on these. In laying the tiles the utmost care should be taken to make as close joints as possible. Considerable security against the entrance of silt and fine sand is secured by carefully covering the joints between tiles. For this purpose tenacious sods, placed with the grass side against the tile, are often effective. Other materials which prove effective are strips of tarred paper, about two or three inches wide and long enough to reach around the tiles, or similar strips of burlap, — old fertilizer sacks cut or torn up answer this purpose admirably.

As soon as possible after the tiles are laid the earth should be filled in, for until this work is complete there is danger of serious damage through washing and caving should excessive rains occur. Care should be taken in filling to compact the earth thoroughly, and to round it up immediately over the line of the drain.

Many authorities recommend putting in silt basins at the junction of laterals with main drains and at points where there is a change in direction. In the writer's experience such basins add considerable to the expense, and are in many cases somewhat difficult to keep in repair. He does not, moreover, regard them as essential, and would advise putting them in only at important points in the system. The simplest method of making a silt basin is to use vitrified sewer pipe set with the lower end about one foot below the level of the tile. The drains are led into and out of it through holes of suitable size, which may easily be cut through the sides of the pipe. A second length of pipe may be set over the first if the depth requires, but the author would advise against carrying such wells to the surface. He would have the upper end of the well at least a foot below the surface of the ground. This must be covered to exclude the earth which will be filled in above it, and for this purpose either a cast-iron cover or a flat stone will be best.

The location of a well may be marked by a stake driven beside it, or it may be indicated on a plan, which, indeed, it is always wise to make and preserve for future reference whenever underdrains are put in.



MASSACHUSETTS  
CROP REPORT

FOR THE

MONTH OF AUGUST, 1908.

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ARTIFICIAL HATCHING AND  
REARING OF CHICKS.

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*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF  
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,  
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# CROP REPORT FOR THE MONTH OF AUGUST, 1908.

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OFFICE OF STATE BOARD OF AGRICULTURE,  
BOSTON, MASS., Sept. 1, 1908.

Bulletin No. 4, Crop Report for the month of August, is herewith presented. We have had a great many inquiries as to artificial methods of hatching and rearing chicks, and this month include a special article on the subject, by Henry D. Smith of Rockland, Mass. Mr. Smith has had a great deal of experience as a grower of South Shore roasters, where only artificial methods are used, and is remarkably successful in artificial incubation and brooding. As he puts it, he is not a professional writer, but has had some success in making chickens live, and in this article he tells what his methods are and how the result may be achieved.

## PROGRESS OF THE SEASON.

The Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for August, 1908) finds the condition of corn on August 1 to have been 82.5 per cent of normal, as compared with 82.8 per cent a month earlier, 82.8 in 1907, and 83.1, the ten-year average.

Preliminary returns indicate a yield of winter wheat of about 14.3 bushels per acre, or a total of 425,940,000 bushels, which compares with 14.6 bushels and 409,442,000 bushels, respectively, the final estimates of last year's crop. The average quality of the crop is 90.1, against 90.5 last year. The average condition of spring wheat on August 1 was 80.7 per cent of normal, as compared with 89.4 a month ago, 79.4 in 1907, 86.9 in 1906, and a ten-year average of 82.7.

The average condition of the oats crop on August 1 was 76.8 per cent, as compared with 85.7 a month earlier, 75.6

in 1907, 82.8 in 1906, and 83.8, the ten-year average on August 1. It is estimated that 5 per cent, or 38,797,000 bushels, of last year's crop is still in the hands of the farmers.

The average condition of barley on August 1 was 83.1 per cent of normal, as compared with 86.2 last month, 84.5 in 1907, 90.3 in 1906, and 85.7, the ten-year average for August.

The condition of rye on August 1 or at time of harvest was 88.3 per cent of normal, as compared with 91.2 on July 1, 88.9 in 1907, 90.8 in 1906, and 88.4, the ten-year average at the time of harvest.

The average condition of white potatoes August 1 was 82.9 per cent, as compared with 89.6 a month earlier, 88.5 in 1907, 89 in 1906, and a ten-year average of 86.8.

The average condition of tobacco on August 1 was 85.8, as compared with 86.6 a month earlier, 82.8 in 1907, 87.2 in 1906, and 82.3, the ten-year average on August 1.

Preliminary estimate of the acreage of hay is 1.2 per cent more than last year, indicating a total of 44,538,000 acres. The condition of the crop on August 1 was 92.1, as compared with 92.6 a month earlier, 87 in 1907, and a ten-year average of approximately 88. The condition of timothy was 89.8, alfalfa 88.8, millet 86.2, and the production of clover hay was about 96.6 per cent of a full crop.

In Massachusetts the average condition of corn was 94; the average condition of oats, 95; the average condition of rye, 92; the average condition of potatoes, 85; the average condition of tobacco, 95; the average condition of pears, 93; the average condition of tomatoes, 90; the average condition of cabbages, 91; the average condition of onions, 89; the average condition of hay, 87, the average condition of timothy, 86; the average condition of clover, 85; the average condition of pastures, 80; the average condition of apples, 65; and the average condition of peaches, 70. The per cent of the acreage of the country of the various crops grown in Massachusetts is as follows: rye, .2; potatoes, 1; tobacco, .6; pears, .8; tomatoes, .8; cabbages, 2; onions, 3.5; watermelons, .1; cantaloupes, .5; hay, 1.7; clover, .1; apples, .9; and peaches, .3.



## TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES NATIONAL WEEKLY WEATHER BULLETIN.]

*Week ending August 10.* — The mean temperature continued warm over the districts from the Rocky Mountains westward to the Pacific, and was also above normal in the Lake region, and from Pennsylvania northeastward over New England, with a slight excess over most of the Atlantic coast and east Gulf States. Temperatures continued below normal over central and western Texas and surrounding sections, and slightly below over all portions of the Ohio, Mississippi and Missouri valleys. Heavy rains occurred in portions of the Mississippi and Ohio valleys, at various points in the Southern States and over New England. The precipitation was slightly below normal in the Pacific coast States north of California and thence eastward to Lake Superior.

*Week ending August 17.* — The mean temperature continued above normal over the Lake region, New England, the Atlantic coast and east Gulf States, and was above normal over all districts east of the Mississippi River, except portions of eastern and southern Florida, the daily excess ranging from  $3^{\circ}$  to  $5^{\circ}$ . Over the upper Mississippi and Missouri valleys and generally over the districts west of the Rocky Mountains, except extreme southern California, the mean temperature for the week was less than normal. Over the greater portion of the Gulf States, most of the Atlantic coast States from Florida to southern New England, the Appalachian Mountain region and portions of the middle Mississippi valley little or no precipitation occurred during the week. The rainfall was above normal in the immediate central and north Pacific coasts, over the eastern Rocky Mountain region and throughout the entire Plateau country. There was also a moderate excess in northern New England.

*Week ending August 24.* — The mean temperature continued above normal over the Gulf and South Atlantic States, and was also above normal in the interior valleys of California and over most of Oregon, Washington and Idaho. Over nearly the entire Rocky Mountain region, the Missouri

and upper Mississippi valleys, Lake region and New England the weekly temperature was below normal, the departures in the Missouri and Mississippi valleys ranging from  $6^{\circ}$  to  $10^{\circ}$ . Over the greater portion of the Gulf and Atlantic coast States frequent showers occurred, and amounts from 1 to 6 inches were received over large areas. Over the Lake region, lower Ohio and upper Mississippi valleys there was a general lack of precipitation. There was a general excess from southern Nebraska to Texas and thence easterly over the Gulf and South Atlantic coast States, and a considerable excess in southern New England and eastern New York.

*Week ending August 31.* — Temperatures above the normal prevailed over the Mississippi and lower Missouri valleys and generally over the Great Plains and southern Rocky Mountain districts, while over the Atlantic and Pacific coasts and the Plateau and northern Rocky Mountain districts they were generally below the normal. The deficiency was from  $6^{\circ}$  to  $10^{\circ}$  per day in districts east of, and including, the Appalachian Mountains. The heavy rains that began over portions of the east Gulf and south Atlantic States on the 24th continued during the 25th and 26th, extending northward on the latter date over the middle Atlantic States and into southern New England. Over the greater portion of the districts between the Appalachian Mountains and the Mississippi River the precipitation for the week was very light. Practically no rain occurred over the western part of the Great Plains region and from the Rocky Mountains westward to the Pacific.

### SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

*Week ending August 10.* — New England. Boston: The temperature was slightly above normal, with no marked extremes. Precipitation was much above normal, all sections except northwestern Vermont having more than 1.5 inches, with greatest amounts of nearly 4 inches in the Merrimac valley sections of New Hampshire and adjoining parts of Massachusetts. Thunderstorms, with heavy showers and

considerable damage by lightning, were frequent from the 4th to the 7th. Sunshine above normal.

*Week ending August 17.* — New England. Boston: Temperatures were higher than last week, with marked departures above normal; maxima of  $90^{\circ}$  reported from several places on the 13th, continuing on the 14th; seasonable rest of week, without notable minima, except  $44^{\circ}$  in New Hampshire on the 16th. Rainfall was very light over the southern portions, but about or exceeding normal over parts of the remainder of the district, with a fall of 1.5 inch over central Maine on the 13th. Sunshine was generally abundant.

*Week ending August 24.* — New England. Boston: The temperature was generally slightly below normal; the minimum on the 21st was below  $40^{\circ}$  in some localities, with frost, but no damage. Rainfall was below normal in northeastern Massachusetts, southeastern New Hampshire, northwestern Vermont and greater portion of Maine; elsewhere normal or above. Amount for week somewhat more than 1 inch in Connecticut, Rhode Island and Massachusetts, except northeast portion. Sunshine was about average.

*Week ending August 31.* — New England. Boston: The temperature was below normal. It was unusually low for the season during the week, minimum on the 29th being near freezing, with frosts in many localities in Maine, New Hampshire and Vermont. Heavy rain on the 26th. Amount for week was above normal in Massachusetts, Rhode Island, Connecticut and southern New Hampshire. There was little or no rain in remainder of New England, where it is much needed. Sunshine average.

### THE WEATHER OF AUGUST, 1908.

The month began with fair and generally clear weather which continued through the 3d. From the 4th until the 7th there was much cloudiness, with frequent thunderstorms, accompanied by lightning of considerable severity, which caused considerable damage in some localities. The rainfall during this time was copious throughout the State, with heavy local showers, and was of much benefit. Over about

all parts of the State there was more than 1 inch of rainfall, and in some localities more than  $2\frac{1}{2}$  inches fell during this time. Thunder showers again occurred on the 11th, 13th and 17th, that gave a heavy rainfall, between 1 and 2 inches, in the greater portion of the Connecticut valley section of the State and in the southern portion of Berkshire County. On the 26th there was a heavy rainfall in the eastern portion of the State, from a storm that passed up the coast, but in the western portion only a small amount of rain fell. After the 26th fair and generally clear weather prevailed. For the month as a whole there was generally somewhat more than the average amount of rain, also somewhat more than the usual amount of sunshine.

The temperature was generally normal during the first ten days of the month. From the 11th until the 15th it was above normal, rising to about  $90^{\circ}$  on the 13th and the 14th in nearly all parts of the State. This was also the highest temperature during the month. After the 15th the temperature was lower than usual, the last week being unusually cold for the season, with an average daily temperature from  $4^{\circ}$  to  $9^{\circ}$  below normal.

In our circular to correspondents, returnable August 24, the following questions were asked:—

1. What is the condition of Indian corn?
2. What is the prospect for rowen, as compared with a normal crop?
3. What is the prospect for late potatoes, and have you noticed blight or rot?
4. How do the acreage and condition of tobacco compare with former years?
5. What is the prospect for apples, pears, peaches, grapes, quinces and cranberries?
6. What is the condition of pasturage in your vicinity?
7. How have oats and barley compared with former years?
8. Are root crops grown for stock feeding or market in your locality, and if so, to what extent?

Returns were received from 151 correspondents, from which the following summary has been made:—



## INDIAN CORN.

The promise for the corn crop was exceptional at the time of making returns, most correspondents reporting a good stand, of good color, well eared, and sufficiently advanced to be practically sure of maturing before damage from frosts could occur. Some few correspondents report that the stover is excellent, but that the crop has not eared well; but these reports are exceptional, and not sufficiently numerous to indicate anything but a first-class crop as a whole. Ensilage corn was in good condition, and the crop promised to be unusually valuable by reason of the large number and well-matured condition of the ears. Cutting for ensilage had begun in some instances at the time of making returns. The acreage devoted to corn is materially increased over previous years, and the grain secured should be of assistance in keeping down the grain bill during the coming winter.

## ROWEN.

In most sections the cutting of the hay crop was followed by several weeks of hot, dry weather, so that the rowen crop will be very light, except on naturally moist land and that in especially high condition of fertility. On these fields a good second crop is always to be secured, but on the bulk of the mowing lands of the State the rowen crop will be light, except with good rains following the cutting of the first crop.

## LATE POTATOES.

The outlook for late potatoes does not appear to be promising. Blight is reported in many instances, with only a few reports of rot, but neither appears to be severe in most cases. However, the reports are that the tubers are small and few in the hill, due to dry weather at the time of setting. In some instances correspondents report that fields where the vines are in excellent condition do not promise to pay for digging. Altogether, the prospect is for a very light crop.

## TOBACCO.

The acreage of tobacco appears to be about the same as last year, with possibly a slight decrease in some towns. Cutting was well under way at the time of making returns. In several sections there had been considerable damage from hail and wind, but otherwise the crop was universally reported as being in first-class condition, one of the finest for years.

## PASTURAGE.

The rains that fell in most sections with fair regularity during the last week of July and the first weeks of August brought pasturage forward very rapidly, and it was reported as good in most sections. In some localities it was not what it should be with good conditions throughout the season, but even there was reported as improving.

## FRUITS.

Apples continued to deteriorate in condition, and only a very light crop will be secured. They dropped badly during the month, and winter varieties will probably be of small size in most cases, owing to the dry weather of midsummer. Pears, peaches and plums will generally be very light crops. Quinces are somewhat better, but hardly an average crop. Grapes promise an excellent crop, barring damage from frosts. Cranberries are considerably below the normal, the reports from the Cape and adjoining sections being generally that there is from one-half to two-thirds of a normal crop. Wild berries have generally been plentiful in all sections.

## OATS AND BARLEY.

Oats are a little below an average crop, where raised for grain, owing to the early drought. Barley is little raised for grain, but is reported as in excellent condition where sown as a late forage crop.

## ROOT CROPS.

Root crops are little grown in western sections for any purpose, the silo having largely driven them out as a stock food, and the market for them for other purposes being very limited. In eastern sections they are grown to a considerable extent for the market by market gardeners and others, and occasionally for stock feeding. On Cape Cod, turnips, called flat Cape turnips, have been a specialty. The usual acreage has been sown there, and they have generally germinated well and appear to be in good condition.

## NOTES OF CORRESPONDENTS.

(Returned to us August 24.)

## BERKSHIRE COUNTY.

*Alford* (LESTER T. OSBORNE). — The corn crop is in the best condition of any crop for some years. There will be about an average crop of rowen. There is no blight or rot on late potatoes, but the crop will be below the average. Early apples are a little more than an average crop; pears and grapes are above average. Pasturage is in good condition. Oats and barley are average crops. Very few root crops are grown. The season is very favorable for gardens, early corn, tomatoes, beans and squashes being the best for years.

*Becket* (WM. H. SNOW). — Indian corn has made a fine growth, and promises a very good crop. The prospect for rowen is very good. Blight has appeared on late potatoes, but there is no rot as yet. Apples will be a light crop; pears and cranberries good crops. Pasturage is in very good condition. There will be large yields of oats and barley. Root crops are not raised to any extent.

*Lee* (A. BRADLEY). — Indian corn is in first-class condition. There will be nearly a full crop of rowen. There is some blight on potatoes, but they promise to yield about 80 per cent of a full crop. Apples in some localities are a fair crop, say 75 per cent, other orchards almost a failure. Oats are a light crop. Root crops are not raised to any great extent.

*Richmond* (TIMOTHY B. SALMON). — Indian corn is in very good condition. There will be more than an average crop of rowen. Late potatoes will give a fair crop, though all have blight; no rot as yet. Apples are a good crop; pears plenty; very few peaches, grapes and quinces. Pastures are in very good condition. Oats and barley are up to the average. Root crops are quite generally grown, from an eighth of an acre to an acre, for cattle feed.

*Washington* (E. H. EAMES). — Corn is fully up to a normal crop. The prospect is that there will be about an average crop of rowen. Late potatoes are not very good, blight and rot having completely destroyed some fields. Apples are almost half a crop; other fruits not raised for market. Pasturage is in good condition. Oats and barley are about average crops. Root crops are raised only for home use.

*Hinsdale* (THOS. F. BARKER). — The corn crop is in very good condition. There will be but little rowen. The potato crop is doomed,



only a few early ones having escaped the blight. Apples, pears and cranberries will give average crops. Pasturage is in very fair condition. Oats are a good crop; no barley raised. Only a few farmers raise root crops, from 50 to 100 bushels each for their own use.

*Windsor* (HARRY A. FORD). — Indian corn is in good condition. There will not be much rowen, the weather having been too dry when the first crop was cut. There is some blight on late potatoes, but no rot. There will be some apples secured. Pastures are in good condition. Oats and barley are fully up to the normal. Root crops are but little grown.

*Savoy* (W. W. BURNETT). — Indian corn is in fine condition, the hot weather having brought it forward, in spite of a late start. There will be a very poor crop of rowen this year. The prospect for late potatoes is not flattering, and there is some blight, but no rot as yet. There will be a very light crop of all fruits in this region. Pastures are short and dry, but the late rains brightened them up a little. Oats are an especially heavy crop, and are mostly cut green for feed.

*Williamstown* (S. A. HICKOX). — There is a good stand of corn, but it is about ten days late. Rowen will be about half a normal yield. Early potatoes were about a three-fourths yield, and late ones will not be above half, blight and rot having appeared. Apples promise about 80 per cent of an average crop; pears and grapes 30 per cent; no peaches. Pastures are short, but have improved with the late rains. Oats and barley are about three-fourths crops. Very few roots are grown here.

## FRANKLIN COUNTY.

*Rowe* (N. E. ADAMS). — Indian corn is in good condition. There will be a good yield of rowen. The dry weather when potatoes were setting injured many fields, and there is considerable blight. There will be a light yield of all cultivated fruits, but there is a big crop of all wild berries. Pastures are in good condition, but the flies are so thick that cows do not give much milk. Oats and barley are good crops. Root crops are not grown in this locality.

*Bernardston* (RALPH H. CUSHMAN). — Corn is coming forward nicely, some having been already cut, and conditions are favorable for the balance of the crop. There will be a light yield of potatoes, with much blight. Apples promise a light crop, but there will be full yields of pears and grapes. Pasturage is much improved by the rains, and is in very good condition. Oats are a very good crop, with more than the usual acreage. Not many roots are grown, and they are used exclusively for stock feeding.

*Ashfield* (ALBERT HOWES). — Indian corn is looking well. There will not be quite a normal crop of rowen, and the crop is rather late. Potatoes promise only a light crop; some blight, but no rot reported. There will be 80 per cent of a full crop of apples; other fruits hardly up to the average. Pastures are looking well for the time of year.

Oats and barley are good crops where sown early. Root crops are not grown to any extent.

*Conway* (L. T. HOPKINS). — Indian corn will be a good average crop. Rowen promises a good yield. Potatoes will be a light crop, the growth of vines being small and the vines mostly dead. The acreage of tobacco is a little less than usual; condition good, but some hail-cut. Apples are a light crop, of poor quality; pears and grapes full crops; few peaches. Pasturage is in good condition for the season of the year, the recent showers having been a great help. Oats are a good crop, but are little grown. If apples are sorted as they should be, there will be but very few No. 1 winter apples.

*Deerfield* (DWIGHT A. HAWKES). — There will be more than an average crop of corn. There will not be a full crop of rowen. The prospect for late potatoes is poor; they have blight, but show no rot as yet. The acreage of tobacco is somewhat reduced, but the condition is excellent. Apples are less than half a crop, and of poor quality. Pastures are in good condition. The cucumber crop, for pickles, is much above the average. Root crops are not grown here.

*Sunderland* (GEO. P. SMITH). — Indian corn is a good crop, and well advanced. There will be a three-fourths yield of rowen, it having grown since the showers. There is some blight on late potatoes. There is the usual acreage of tobacco, and it has made a fine growth, though some fields were damaged by storms. There will be very few apples; pears and grapes are normal crops. Pasturage has improved very much during the past month. Root crops are not grown to any extent. The damage by the storm of the 11th was from one-fourth to three fourths of the value of the fields affected, and about half the acreage was affected in this town.

*Erving* (CHAS. F. CLARK). — Indian corn is in good condition. There will be a two-thirds crop of rowen. There will not be a large crop of potatoes, though neither blight nor rot have appeared. There will be a small crop of apples, but pears are plenty. Pasturage is in fair condition for the season. There will be an average crop of oats; barley is little raised. Root crops are not raised in this section.

*Northfield* (THOMAS R. CALLENDER). — Corn is well eared, and there is promise of more than an average crop. There will be about half a crop of rowen. Blight is very general on late potatoes and the prospect is the poorest in years. The acreage of tobacco is about the same as usual, and the crop is the best for several seasons. All fruit will be light except pears and grapes. Late rains have brought pastures to nearly normal condition. Oats have proved a good crop, with very little rust. Root crops are not grown to any extent. Cucumbers for pickles have given an abundant yield so far, but blight has appeared, and the season is now nearly over, having been two weeks earlier than usual.

*Orange* (A. C. WHITE). — Corn was badly blown down by the storm

of the 13th, but is otherwise looking finely. There will not be more than half a crop of rowen. Potatoes are generally poor, with a small yield. Pears and grapes are normal crops. Pasturage has been improved by the late rains. Some few grow root crops for the market, but none for stock feeding.

## HAMPSHIRE COUNTY.

*Prescott* (W. F. WENDERMUTH). — Indian corn is a good average crop. Rowen will be fully up to the average. Late potatoes have blighted considerably, and promise only a very light yield. Apples are a fair crop, but not up to the average; pears and grapes good; other fruits not raised. Pasturage has improved a great deal during the past month. Oats and barley are not up to the average. Root crops are not grown here.

*Pelham* (JOHN L. BREWER). — Indian corn is looking finely. There will be only a small crop of rowen. Late potatoes have blighted badly. Apples, peaches, grapes, quinces and cranberries will give fair yields. Pastures are improving in condition. Oats and barley are full crops.

*Amherst* (WM. P. BROOKS). — Corn is in the best condition I have ever seen it. The rowen crop is rather below the normal, but will be good where the land is rich. The yield of potatoes will be light; blight has appeared, but no rot. Apples will give a poor crop; pears good; peaches fair; grapes promise well. Pasturage is in good condition. Oats and barley are hardly raised at all. Root crops are little grown, ensilage having replaced them. There is a normal acreage of tobacco and a good crop, with some hail damage in a few places; cutting about half over. Onion harvest has begun, and thrip damage is not so general as was feared.

*Hadley* (H. C. RUSSELL). — Indian corn is in excellent condition. The rowen crop is as good or better than the average. Potatoes will be very light, blight having struck the crop early, in spite of spraying. Tobacco has made a fine growth in the last three weeks, and is being harvested in splendid condition; acreage about as usual. Pears and grapes are very plenty; other fruits poor. Pastures are looking well. Root crops are not raised to any great extent.

*South Hadley* (W. F. PERSON). — Corn looks well, considering the late spring, and is earing well. Rowen will give a good crop. Late potatoes will be a small crop, nearly all having blighted. Apples are a small crop; grapes plenty. Pastures are in very good condition. Oats are not up to an average crop. Roots are not grown for feeding purposes, but are largely grown for market.

*Hatfield* (THADDEUS GRAVES). — Corn is in fine condition, and about two weeks earlier than usual. There will be about half a crop of rowen, though it is improving. Potatoes are about half a crop, dry weather having injured them and blight attacking them. There is the usual



acreage of tobacco, which is mostly harvested in good condition. Apples will be half a crop; pears good; other fruits as usual. Frequent rains of late have kept pastures green. Oats and barley are little raised. Root crops are little grown. Onions promise a fine crop.

*Easthampton* (WM. C. CLAPP). — Most fields of corn are fairly well eared. There will be a fair crop of rowen. All potatoes have suffered from blight. Tobacco is looking well, but the acreage is decreased from last year. There will be few quinces, grapes or peaches, and not a heavy yield of apples and pears. Pasturage is looking fairly well. Not much barley is grown. Root crops are not grown to any extent.

*Williamsburg* (F. C. RICHARDS). — Indian corn is in excellent condition. Rowen will be somewhat under the normal, but a fair crop. Potatoes are a very light crop, being badly blighted. Apples are 35 per cent of a full crop; pears 75 per cent; peaches 90 per cent; quality good. Pastures are recovering rapidly under the recent rains. Oats and barley are good average crops. Root crops are but little grown.

*Middlefield* (J. T. BRYAN). — Indian corn is in excellent condition. Rowen is a full average crop. There is some complaint of blight on late potatoes. There will be very few apples, but small fruits are abundant. Pasturage is in good condition. There are full crops of oats and barley, they being mostly cut for fodder. Root crops are not much grown.

#### HAMPDEN COUNTY.

*Chester* (C. Z. INZELL). — Corn is a good crop. There will be about a normal yield of rowen. There will be a light crop of late potatoes, there being some blight. Apples are a small crop. Pasturage is in good condition.

*Blandford* (ENOS W. BOISE). — Indian corn promises extra well, showing a heavy growth of stover, and earing well. Rowen will be a good crop on early cut fields. The prospect for late potatoes is poor, blight having appeared on most fields. Apples promise within 10 per cent of a normal crop, the fruit being fair and of good size. Feed in pastures is very short, mainly on account of early summer drought. Oats and barley are full yields, and well headed. Root crops are very little grown.

*Tolland* (EUGENE M. MOORE). — Corn is looking well, and will be a good average crop. Rowen will be a light crop, owing to dry weather. Potatoes are not an average crop, blight having attacked most fields. Apples are about three-fourths of an average crop; pears about average. Feed is short in pastures, though much improved since the recent rains. Oats and barley are good crops, above average. Root crops are grown somewhat for stock feeding, but not to any great extent.

*Southwick* (L. A. FOWLER). — Indian corn is in good condition. Rowen will be above an average crop. There will be a very light crop



of late potatoes, they having suffered from blight in many instances. There will be a very light yield of fruit at best, none in some localities. Pasturage is in good condition. Root crops are very little raised.

*West Springfield* (T. A. ROGERS). — The warm weather of June and July made an extra growth of stalk on corn, but the crop is not eared well, and will be below the normal. Rowen is now doing well, though late starting, on account of drouth. There will be about half a crop of potatoes, nearly all fields having blighted. Apples are a poor crop; pears full; peaches a little below the normal; grapes full; quinces few. There is about the usual acreage of tobacco, and it is mostly looking well. Pastures are looking well since the recent rains. Oats are generally a good crop, though little raised. Some mangels and turnips are raised, but not to any great extent.

*East Longmeadow* (JOHN L. DAVIS). — Indian corn is in very good condition. There will be half a crop of rowen. Late potatoes are almost all blighted, and the crop will be very light; no rot as yet. Fruit will be a heavy yield. Pasturage is very short, but the recent rains have helped it somewhat. Oats and barley are average crops. Turnips are raised for stock feeding, but not to the extent which they should be.

*Wilbraham* (HENRY M. BLISS). — Indian corn is in excellent condition. Rowen will not be above half a crop, though the recent rains have helped it, as well as feed in pastures. There will be a very light crop of late potatoes, blight having appeared. The acreage of tobacco is 90 per cent, and its condition 95 per cent. Apples half a crop; pears a three-fourths crop; peaches 90 per cent, and quite extensively grown; grapes 100 per cent; quinces 70 per cent; cranberries 85 per cent. Oats are a good crop. Root crops are little grown.

*Ludlow* (CHAS. B. BENNETT). — Indian corn is in first-class condition. Rowen will give more than an average crop. Late potatoes will be a very poor crop, with some blight and rot. Apples and pears are light crops; no peaches; grapes very heavy. Pasturage is in excellent condition. Oats and barley are about average crops. Turnips and carrots are grown, and are in good condition. Ensilage corn is very early, and silos are being filled. Squashes and vines of all kinds have made an unusually good growth.

*Palmer* (O. P. ALLEN). — Indian corn is not as fully eared as usual, but is otherwise in good condition. Recent rains have brought the promise of a good crop of rowen. The crop of late potatoes is not as good as usual, but I have not noticed any rot. There is the prospect of a very fair yield of fruit of all kinds. Recent rains have brought pasturage into good condition. Oats and barley compare very favorably with former years. Root crops are not grown to any large extent.

## WORCESTER COUNTY.

*Brookfield* (FRANK E. PROUTY). — Indian corn is in extra good condition. The rowen crop promises to be good. There is some blight on potatoes, but there will be about an average crop. Apples are about two-thirds of a crop. Pasturage is in good condition. Oats and barley are about average crops. Root crops are not grown to any extent. Pears are a good yield; peaches little raised; grapes good; quinces few.

*West Brookfield* (MYRON A. RICHARDSON). — Corn is looking finely, and is well eared, except now and then a field where the growth of stalk is more than normal. There will be some rowen, but less than a normal crop. Potatoes seem small and few in a hill; some fields have been struck by blight. There is an abundance of fall and early apples, but winter ones are dropping off. Most pastures are looking finely. Both oats and barley are up to the normal. Roots for stock feeding are not raised to any great extent, but are doing finely.

*New Braintree* (C. D. SAGE). — Both field and ensilage corn promise a fine crop. Rowen is rather late, but there may be half a crop. Only a fair crop of potatoes is reported; have seen very little blight or rot. Apples 25 per cent of a normal crop; pears 60 per cent; peaches 25 per cent; grapes 75 per cent. Pasturage is in fair condition, the heavy rains having revived it somewhat. Oats were a good crop; little barley grown. There has been much complaint of cows falling off in milk, and with the high price of grain there will have to be a sharp advance in the price of milk, or little will be produced.

*Petersham* (B. W. SPOONER). — Since the drought was broken, corn has made rapid progress. The rowen crop is not a good one, but the late rains have helped it. There is no rot on potatoes, but most fields are dried up; a two-thirds crop is promised. Apples fell off badly; pears good; peaches and grapes good. Pasturage is much improved by the recent wet weather. Oats are a good crop, where raised. Very few roots are raised here. Cows are increasing in milk since the rains.

*Royalston* (C. A. STIMSON). — Indian corn is in fair condition. Rowen promises half a crop. There will be half a crop of late potatoes, all being blighted. Apples are half a crop; pears three-fourths; peaches 10 per cent; grapes 90 per cent; quinces 10 per cent. Oats and barley are three-fourths crops. Root crops are not grown for feeding, and but little for market.

*Ashburnham* (E. D. GIBSON). — Indian corn is about a normal crop. There will be a fair crop of rowen if we continue to have abundant rains. Potatoes will not be a full crop, blight showing on nearly all fields. There will be a light crop of winter apples; pears fair; peaches good. Pasturage is better than two weeks ago. Oats and barley are not quite average yields. Root crops are not grown in this section.

*Hubbardston* (CHAS. C. COLBY). — Indian corn has made an excellent

growth, and the crop will be above the average. Rowen will be the best crop for several years. Potatoes will be a light crop, owing to blight. The apple crop will not be up to the average. Pasturage is in excellent condition. Oats and barley are heavy yields, both as grain and forage crops. Root crops are grown for stock food to a limited extent.

*Sterling* (HENRY S. SAWYER). — Corn is looking finely, and there is the prospect of a good crop if warm weather continues. Rowen is hardly up to a normal crop. Blight has struck some fields of potatoes, but others are looking well. There will be good yields of apples, pears and grapes. The frequent rains of late have improved the condition of feed in pastures. Oats are less than a normal crop. There is a very small amount of roots raised for feeding, and beets, carrots and turnips are raised to some extent for market.

*Bolton* (H. F. HAYNES). — Indian corn is a good crop on moist land, but poor on light soil. Rowen will be about an average crop. There is some blight on potatoes, and the crop as a whole will not be over 25 per cent of a normal crop. Apples are a very poor crop; pears and peaches good. Pasturage is now in good condition since the rains. Oats and barley are all cut for hay. Root crops are not much grown. A careful examination of eight fields of potatoes shows two where the tubers are nearly all large, but only from two to five in a hill; two fields that might give 25 per cent of a normal crop; and four that will not yield enough to pay for digging, — one of these is of six acres.

*Worcester* (H. R. KINNEY). — Corn is in good condition. The rowen crop is better than usual. Potatoes do not look at all promising, and there is some blight. Apples are looking finely; pears light; peaches poor; grapes good. Pasturage is in better condition than is usual at this time of year. Oats and barley are not raised to any extent. Root crops are looking better than usual; mangels and carrots are raised for feeding to some extent. Practically speaking, all the corn raised here is for ensilage or sweet corn for the market, and it has come on fast since the rains.

*Shrewsbury* (FRED J. REED). — Indian corn is in very good condition. The rowen crop will be heavier than was expected, but is still a light crop. The prospect for late potatoes is not very good; some blight, but no rot as yet. The fruit crop will be light, but of good quality. Oats and barley are about normal crops. Root crops are grown for market to a certain extent.

*Southborough* (E. F. COLLINS). — All kinds of corn are in excellent condition. Rowen will be about half a crop. There will be a very light crop of late potatoes. Apples are about half a crop. Pasturage has improved, and is in fine condition. Root crops are not grown in this section.

*Mendon* (J. J. NUTTER). — Indian corn is in good condition. Rowen is looking very well. The prospect is that there will be a poor crop of



late potatoes, as they have blighted badly. There will be one-third of a normal crop of apples; few peaches and quinces; plenty of grapes. Pasturage is in very good condition. Oats and barley are average crops. Root crops are not much grown.

*Blackstone* (O. F. FULLER). — Indian corn is in good condition. A good crop of rowen is promised in this section. Late potatoes have blighted somewhat. There will be a fair crop of fruit and about half a crop of apples. Pasturage is in good condition. Oats and barley are normal crops. Root crops are somewhat grown for stock feeding. Cranberry worms have ruined the cranberry crop.

## MIDDLESEX COUNTY.

*Sherborn* (N. B. DOUGLAS). — Corn is looking very well, though somewhat stunted by drought on light soil. Rowen is light now, but with more rain an average crop will be secured later. Late potatoes have not set well, and blight is quite prevalent. Apples are a fair crop; peaches a light crop; pears a full crop; also grapes. Pasturage is in fair condition.

*Framingham* (J. S. WILLIAMS). — Indian corn is looking finely; I doubt if the crop was ever better. Rowen promises well on moist land, but as a whole will be far below the normal. The potato crop appears to be light, being of good quality, but with few in the hill. Fruit makes a rather poor showing; peaches and pears are poor in quality; winter apples will be a light crop here. Our pastures have revived wonderfully, and feed is fairly good, notwithstanding the drought. Oats and barley are raised only for forage, and each made a good growth. Roots are not grown as extensively as they should be; mangels are raised for feeding cows, and are in much favor.

*Maynard* (L. H. MAYNARD). — Indian corn is in good condition, and will be a normal crop. Rowen is in good condition, and early cut fields will yield well. Potato vines look remarkably well, but the yield will be short on most fields, many vines not having set a tuber. Apples will be about 60 per cent of a full crop, and for late fruit the quality will be poor; other fruits in abundance. Recent rains have improved the pastures, but in most of them the feed is short. Oats and barley have been good crops for forage. Root crops are grown almost wholly for market.

*Littleton* (GEO. W. SANDERSON). — Corn is in good condition. Rowen will give more than a normal crop. I notice no blight or rot on late potatoes, and there is the prospect of a fair crop. Apples and pears are good crops, above the average; other fruits are very little grown. The recent rains have improved pastures. Oats and barley compare favorably with a normal crop. Root crops are grown to a very limited extent.

*Westford* (J. W. FLETCHER). — Indian corn is in good condition. There will be a fair crop of rowen, but it will be very late. Late



potatoes are not worth digging. Winter apples are scarce, but fall apples are plenty. Pasturage is in very good condition since the rains. Root crops are not grown in this section.

*Dunstable* (A. J. GILSON). — Corn is in fine condition, and with good weather there will be a heavy crop. Rowen will be about an average crop. The prospect is for a light crop of potatoes, blight appearing on all fields. Apples promise a light crop, also pears and peaches; grapes are a medium crop; no quinces; cranberries a fair crop. Pasturage has improved since the rains, so that it is in very good condition. Oats and barley are principally raised for forage, and are good yields. Root crops are grown both for market and stock feeding, but only to a small extent.

*Billerica* (GEO. P. GREENWOOD). — Indian corn is in fair condition. The prospect for the rowen crop is good. The yield of potatoes will be light, but there is little blight or rot. Fruit of all kinds is below the average. Pasturage is in good condition. Root crops are very little grown.

*Tewksbury* (G. E. CROSBY). — There will be a fair crop of rowen. Potatoes have blighted badly on some fields. Apples, pears and peaches will give very light yields. Feed in pastures is much improved since the rains. Roots are grown for market quite extensively on some farms, but not to any great extent for stock feeding.

*Concord* (WM. H. HUNT). — Indian corn is looking well. Rowen will do better than it promised, but will not be a full crop. Potatoes will not be a full crop, there being some blight. Apples are about half a crop; pears a little better; other fruits about average. Pastures suffered severely from the early drought. Oats and barley are rather below the average. Mangels are grown some for stock feeding, but not much; also turnips, but they are not yet matured; all root crops are looking fairly well.

*Stoneham* (J. E. WILEY). — Indian corn is very little raised in this town. Rowen will be a light crop. Late potatoes promise a fair crop, and no blight or rot has appeared. Apples and peaches fair crops; pears and grapes good crops. Pastures have improved since the rains. Root crops are not grown to any extent.

*Weston* (HENRY L. BROWN). — Rowen is making good a growth now, and will be a fair crop, though late. There will be but a small crop of late potatoes. Apples, pears and peaches will give fair yields. Pasturage is in good condition. Oats and barley are grown for forage only, and are fair crops. Mangels and turnips are grown to some extent. Fall apples have been small and have dropped badly.

## ESSEX COUNTY.

*Salisbury* (WESLEY PETTENGILL). — Corn is looking finely, and there is prospect of a good crop; more planted than usual. Rowen is a good normal crop, having grown rapidly since the rains. Potatoes will be

but a light crop, and there is some blight, but no rot. Apples and peaches are light crops; pears and grapes good; cranberries fair. Pastures are good for the time of year, having improved since the rains. Oats and barley are mainly grown as forage crops. Root crops are mostly grown for market. Peach trees have been dying in this section all summer, many trees that blossomed full having since died.

*Amesbury* (F. W. SARGENT). — Corn is making a splendid growth, and is heavily eared. The prospect for rowen is good, and frequent showers keep it growing. The prospect for the potato crop is fair, with little blight as yet. Apples of good quality will be scarce; pears too plentiful for the demand. Pasturage is rather poor, though a late growth is starting. Oats and barley are short yields, because of drought. Roots are little grown for feeding, and only to a small extent for the market. Since the rains commenced, vegetation has made rapid growth and many crops have recovered.

*Groveland* (A. S. LONGFELLOW). — Indian corn is in very good condition. There will be very little rowen. The prospect is fair for late potatoes, though there is some blight, but no rot. Apples are half a crop; pears and peaches are a full crop. Feed in pastures is much improved by the rains. No oats or barley are grown except for forage. Root crops are grown only to a very limited extent.

*Newbury* (GEORGE W. ADAMS). — Indian corn is in fair to good condition. The rowen crop will be light, but is now recovering from the drought. There is a good prospect for the crop of late potatoes. There will be enough apples; pears are an average crop; also quinces; peaches and grapes fair. Pasturage is recovering, and is fairly good now. Oats and barley are full average crops. Root crops are not grown to any extent. The tent caterpillar has done far more damage with us than the brown-tail moth.

*Rowley* (D. H. O'BRIEN). — Indian corn is in very good condition. The rowen crop will be below the average. Potatoes are a very light crop, and have blighted badly. All fruits are about an average crop. Pastures are in quite good condition. Oats and barley are very little grown, but are looking well. Root crops are grown both for feed and market on a small scale.

*Topsfield* (B. P. PIKE). — Corn is in very good condition. Rowen is looking well, but is very late. The prospect for late potatoes is very good, and there is not much blight. Apples are half a crop; pears average; peaches below the average. Pasturage is in fair condition. Oats and barley are not raised for grain. Root crops are not much grown. There are very few peach trees alive, but the crop is good on those; grapes, quinces and cranberries promise good yields.

## NORFOLK COUNTY.

*Randolph* (RUFUS A. THAYER). — Indian corn is very promising. Rowen is about half an average crop. Late potatoes look well, with no rot or blight as yet. Apples are half a crop; pears good; no peaches; grapes good. Pasturage is in excellent condition for the time of year. Oats and barley are good crops, but are grown for forage. Some turnips are raised for market, and are a good crop. Fall feed on mowings will be very good, with rowen only on moist, rich soil.

*Canton* (EDWIN V. KINSLEY). — Corn was never a better crop, both for grain and stover. There will be more than an average crop of rowen. Potatoes are a very light crop; no rot as yet, but some blight. Apples are a light crop; pears about average; cranberries fair; other fruits light. Pastures are in fair average condition. Oats and barley are good crops. Some winter turnips are grown for market, and some mangels for feeding, but not to a large extent. White pines are very generally seeding this year.

*Norwood* (F. A. FALES). — Corn is looking first rate. We shall have 50 per cent more rowen than usual. Potatoes are not looking well, the dry weather retarding their growth, while with the rains blight appeared on some fields. Apples and pears were badly injured by the scale, and the crop will be light; cranberries will be a light crop. Pastures are dry, and in poor condition. There is a fair crop of oats and barley. Root crops are not grown to any extent, flat turnips being grown the most frequently.

*Walpole* (EDWARD L. SHEPARD). — Corn fodder looks fairly well, but there are not as many ears as in a normal year. There will be about half a crop of rowen, on account of the drought. Late potatoes are looking well; some blight, but no rot as yet. Apples are half a crop; pears, peaches and grapes are good crops. Pasturage is better than a month ago, but is still rather short. Oats and barley are about normal crops. Comparatively few roots are raised.

*Norfolk* (A. D. TOWNE). — Indian corn promises a crop 25 per cent heavier than usual. Rowen will be more than an average crop. There will be a fair crop of late potatoes, with some blight. Apples, pears and grapes are good crops; other fruits light. Pasturage is hardly up to the average in condition. Oats and barley are not quite as heavy crops as commonly. Root crops are not grown to any extent.

*Franklin* (C. M. ALLEN). — Indian corn is looking finely. There will be a three-fourths crop of rowen. Late potatoes are not a full crop. There will be more than an average crop of apples; pears fair; peaches few; grapes good. Pasturage is 25 per cent below the normal in condition. Oats and barley are 90 per cent of the normal. Root crops are not grown in this section.



## BRISTOL COUNTY.

*Mansfield* (WM. C. WINTER). — Indian corn is looking finely. There will be a normal crop of rowen. Indications are good for a full crop of late potatoes; no blight or rot as yet. Winter apples will be a light crop; pears and grapes full; peaches and quinces fair. Pasturage is in good condition. Oats and barley are normal crops, but are not much grown. Carrots, parsnips, turnips and beets are raised for market, but only in a small way. The weather of the last month has been favorable to all crops.

*Attleborough* (ISAAC ALGER). — Indian corn is in splendid condition. There will not be much rowen. There will be a fair crop of late potatoes. The yield of fruit will be light. Pasturage is improving in condition. Oats and barley are about average crops. Root crops are not much grown.

*Dighton* (HOWARD C. BRIGGS). — The corn crop is in good condition. There is almost no rowen, say 10 per cent of a normal crop. Late potatoes promise poorly at present, with some blight. Apples dropped badly; other fruits fair. Pastures are in very poor condition. Oats and barley are about average crops. Root crops are not grown to any extent. The drought is only partially broken here, and we need rain badly for all crops except corn.

*Berkley* (ROLLIN H. BABBITT). — Indian corn is in very good condition. Rowen will give about half an average crop. Very few late potatoes are grown about here, and there is some blight. Apples are a poor crop; pears plenty; peaches few; grapes plenty; quinces few; cranberries half a crop. Pasturage is in excellent condition. Oats and barley are much below the normal. Root crops are grown only for market, and not extensively for that purpose.

*Swansea* (F. G. ARNOLD). — Corn is in very good condition. The rowen crop is much below the standard. The prospect for late potatoes is good; no blight, but some damage from drought. Pears, peaches and grapes promise good crops. Pasturage is above the average for the season of the year. Oats are about an average crop; barley only grown for forage. A few mangels are grown for stock feeding and a few turnips for the market.

*Westport* (ALBERT S. SHERMAN). — Indian corn is in good condition, both fodder and grain promising well. The prospect for the rowen crop is poor, owing to dry weather. Potatoes promise well, and there is no blight or rot as yet. Apples are scarce and poor; pears quite plenty; no peaches; grapes abundant. Pastures are in fair condition, the rains having started up the grass. Oats are a better crop than usual; barley not grown here. Root crops, especially turnips, are extensively grown, both for market and stock feeding.



## PLYMOUTH COUNTY.

*Norwell* (H. A. TURNER). — Indian corn is in good condition. There will be about half a crop of rowen. Blight has not attacked potatoes much as yet. There will be few apples; peaches, grapes and cranberries are good crops. Feed in pastures is rather short, and needs more rain. Oats and barley are little raised. Beets are raised to a slight extent as feed for fowls.

*Hanover* (HARRISON L. HOUSE). — The corn crop is in fair condition. The rowen crop will be short. There is prospect of a fair crop of late potatoes, with some blight. Apples, pears and grapes are good crops; peaches fair; quinces little raised; cranberries good. Pasturage is in good condition. Oats are raised for forage, and are a good crop; no barley raised. Root crops are not raised in this vicinity.

*Brockton* (DAVIS COPELAND). — Indian corn is in good condition. The prospect is that there will be a normal crop of rowen on moist land. Not many late potatoes have been planted here. The prospect for apples is poor, but pears and grapes promise good crops. Pastures are in good condition since the rains. Oats and barley are not much raised. Root crops are not raised for stock feeding, but carrots, beets and parsnips are raised as market-garden crops.

*West Bridgewater* (CLINTON P. HOWARD). — Indian corn is in very good condition. An average crop of rowen is expected. There will be a good crop of late potatoes on low land, and very light yields on dry fields. There are few apples; pears, grapes and cranberries plenty. Roots are little raised for stock feeding, but all kinds are raised for market.

*Kingston* (GEORGE L. CHURCHILL). — The corn crop is in very fair condition, as good as usual at this time. An average crop of rowen may be expected. Late potatoes are looking well, and blight or rot have not appeared. Apples are good; pears plenty; grapes, quinces and cranberries fair. Since the rains, feed in pastures is very fair. Oats and barley are good crops, but little raised. Some roots are grown, and are in good condition. The season now promises to be a very prosperous one, vegetation having grown well since the rains.

*Carver* (J. A. VAUGHAN). — Indian corn is in good condition. Rowen promises to be a good crop. Potatoes were cut short by dry weather, but I have noticed no rot. There is a fair crop of apples and pears. Pastures are dry and short. Root crops are grown to a small extent. Cranberries on many bogs are a very light crop, while on others a good crop may be expected; the crop as a whole does not promise to be an average one.

*Rochester* (GEO. H. RANDALL). — Indian corn is generally a poor crop, about half the normal. Rowen did not start well, and will be a small crop, though it looks bright and thrifty now. Late potatoes are half a crop of medium size and smooth, with no blight or rot. Apples

and pears are quite good crops; few peaches; grapes good; quinces few; cranberries half a crop. Pasturage is too late in starting to give much feed. Oats and barley are below average yields. Root crops are grown to a very limited extent, both for feeding and market. All early crops suffered from the drought, but late crops are very promising.

### BARNSTABLE COUNTY.

*Falmouth* (D. R. WICKS). — Indian corn is fully up to the normal, the rains having brought the crop forward. The prospect for rowen is very poor on high ground, but there will be a two-thirds crop on low, moist land. There is some blight on potatoes, but no rot, and a two-thirds crop is promised. Apples are one-third of a normal crop; pears one-half; peaches one-third; grapes normal; quinces half; cranberries two-thirds. Since the rains, pastures have started up and are looking well. Oats and barley are mostly grown as forage crops. Root crops are not very largely grown.

*Mashpee* (W. F. HAMMOND). — Indian corn is above the average. Rowen will yield less than an average crop. Late potatoes promise about an average crop, with little blight. Apples are half a crop; pears two-thirds; grapes a full crop; cranberries half a crop. Pastures are above the average in condition. Oats are about an average crop. Root crops are grown for stock feeding and for market, one-third for the former purpose and two-thirds for the latter.

*Dennis* (JOSHUA CROWELL). — Indian corn is in good condition. Rowen promises half a crop. The yield of potatoes will be below the average, but no blight or rot has appeared. Fall apples are a fair crop, and winter apples are scarce; cranberries less than half a crop. Pasturage is in fair condition. Root crops are grown to a small extent for stock feeding. Many cranberry bogs are suffering from the ravages of the berry worm.

*Harwich* (AMBROSE N. DOANE). — Corn is in very good condition. There will be a fair crop of rowen. Potatoes are a very small crop, with no rot as yet. All fruit crops are very poor. Pasturage is not in good condition. Oats and barley are about average crops. Root crops are little grown except for home use.

*Eastham* (J. A. CLARK). — Corn is looking finely, and only needs a warm September to carry it out. The recent rains have improved the rowen crop very much. Blight has appeared on potatoes, but no rot. There are plenty of early apples, but winter varieties are short. Pastures are in good condition. Turnips are grown largely for market. Potatoes are mostly early, and, though somewhat damaged by drought, will prove a fair crop. Late turnips are looking finely at present. Old beds of asparagus are somewhat rusted, but young beds are looking well. The cranberry crop will be a medium one.

*Truro* (JOHN B. DYER). — Indian corn is not much raised, and the crop is not too good. The prospect for rowen is very poor, owing to

dry weather. On low land potatoes are a fair crop, but are poor on uplands. Apples are a fair crop; pears are rotting on the trees, as never before; grapes fair; cranberries a rather light crop. Pasturage is dry and short. Oats and barley are not raised hereabouts. There are some beets and turnips and a few carrots grown for market.

#### DUKES COUNTY.

*West Tisbury* (GEO. HUNT LUCE). — Indian corn is in fair condition. The prospect for rowen is poor. There will be a very poor crop of late potatoes. The prospect is below the average for fruit of all kinds. Pastures are in average condition. Oats and barley are average crops. Some roots are grown for market, but not to any great extent.

#### NANTUCKET COUNTY.

*Nantucket* (H. G. WORTH). — Corn is in very good condition, considering the drought. Rowen is looking well. Potatoes are giving only a light yield, but do not show much blight or rot. Cranberries suffered from the dry weather. Pasturage is in very good condition since the rains. Oats and barley are below the normal. Most of our farmers grow a few roots for stock feeding.

## BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

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### ARTIFICIAL HATCHING AND REARING OF CHICKENS, AS APPLIED TO "SOUTH SHORE ROASTERS."

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By HENRY D. SMITH, Rockland, Mass.

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The hatching and raising of chickens artificially has been practised for ages, but the last decade has been marked with the greatest strides, as is shown by the vast number of incubators and brooders that are being made daily by the various manufacturers, all of which are being sold and used, which means that the poultry industry is still growing.

The question is often asked, "With all of this increase in the production of poultry products, is not the time near at hand when the poultry business will be overdone?" The reply is, "*No*, not as long as the demand increases as fast as the supply." And to-day Massachusetts is only producing about one-half of the poultry products that she is consuming, and again, while the price for spring roasters has not been any higher for the last two years than formerly, it has remained high for a longer time, which is just as good if not better for the poultryman.

To illustrate the importance of artificial methods in the hatching and rearing of chickens, just imagine our going back to the old hen for an incubator and a brooder! We might as well go back to the ox team for our transportation, and discard the steam and electric cars as well as the automobile and the flying machine, which is almost here.

With all of the incubators mentioned above going broadcast all over the country, into the hands of the novice as well as the expert, the question very naturally comes up, "Just what is the proper method for operating an incubator to get the best possible results?" In considering this question we must assume that the eggs are from good, strong, vigorous stock, which means not only stock from good parents, but those that are fed properly and comfortably housed. Almost any good variety of grains thrown in the litter of from four to six inches deep every morning (three parts of corn, one part each of wheat, oats and barley, makes a very good mixture), with a so-called dry mash, composed of equal parts of ground oats, middlings, Indian meal and beef scraps, until the hens get to laying well, then reduce the scraps to one-half of a part, makes a very good feed. The dry mash is practically before them all of the time in troughs or hoppers, and of course plenty of good water, shells, charcoal and plenty of green stuff in some form, — clover, alfalfa, rowen hay, cabbages, mangels, beets, or any



of the many things that are the most available about the farm. Then the eggs should be gathered at least once a day, and in cold weather often enough so that they do not get chilled, every egg being marked with the number of the pen in which it was laid, so that when there are sufficient eggs to set a machine, a record can be made of how many eggs came from each pen.

In starting the incubator, the manufacturers' directions are sufficient, and their instructions for operating are as good as can be given in a general way for all parties and all conditions; but right here is where the difficulty, the mystery, and all of the varied opinions and controversies begin. If it were possible to have the very same conditions in every one's incubator room, the same instructions would apply to all; but until then, no rigid, fixed, arbitrary rule can produce the best results. To illustrate the different conditions that it is possible to obtain, divide the humidity into the following classes, — very wet, wet, damp, normal, dry, and very dry; then divide the ventilation into very poor, poor, fair, good, and very good; then make as many divisions of the temperature, from freezing to  $85^{\circ}$  or  $90^{\circ}$  above; now figure up the number of combinations that there are in all of the above features, and see what the little, insignificant embryo chick must contend with before the operator begins to manipulate the machine at all.

In starting an incubator, the best thing to do — and it is not difficult — is to follow the manufacturers' directions, and then by careful experiments, and records of them correctly kept, ascertain just how the best results can be obtained under one's own conditions. Now this seems to leave the party seeking information right where he began, but it does not if he thoroughly "digests" it, or grasps the writer's idea. Suppose a party buys his first incubator, and before starting it he goes to half a dozen different poultrymen, all equally successful, and finds out just how each one is running his machines: the chances are more than even that there will not be two of them that are doing exactly alike, and the party finds himself more bewildered than ever, when as a matter of fact they have all been honest with him, and are doing the very best that can be done under *their conditions*. For instance, one may run his as high as  $104^{\circ}$ , and perhaps is "airing" or "cooling" the eggs a great deal; where another may run his from  $102\frac{1}{2}^{\circ}$  to  $103^{\circ}$ , and is not airing his eggs at all; again, one may not supply any moisture at all, where another will be sprinkling them twice a day; and another has a wet sponge or some water pans in the incubator, or a wet blotting paper around the heater, and another will wet the floor down *wet*; then there are all kinds of ways of ventilating both the incubator and the room, so that I will have to reiterate, as above, that there is no one rule that will apply to us all.

With all of the above explanations, so that no one will be misled, I will now try to explain what my conditions are, and how I handle my incubators. The cellar is 12 by 26 feet, and 5 feet deep to the top of the stoning, and the roof sets right on the stone work. The floor is not cemented, as the tendency would be to make it too dry, and we intend to keep the floor good and damp all of the time. The roof is sheathed up on each side about  $4\frac{1}{2}$  feet on the rafters, then level across the top, thus forming an air chamber, which helps to maintain an even temperature in the room. For ventilation there is an imitation fireplace in the stone work at one end, which leads up to a wooden chimney, and there is on this same end a window 30 by 30 inches, which is always open excepting in a driving storm, or when it is so cold that the incubators cannot be kept up to the proper temperature readily;

the entrance is at the other end, with a door at the top and bottom of the stairs, each door having a slide 8 by 12 inches, which is used for more ventilation, and there is a small ventilator out through the roof. There is no heat supplied other than the incubator lamps.

In this room there are eight No. 3 Standard Cyphers Incubators, holding from 380 to 400 eggs each, according to the size of the eggs, of the 1906 and 1907 patterns, having the drawers for the chicks to drop into after they are hatched, and the drop bottom; and they also have an electric light placed close to the thermometer, so that the temperature can be read easily and correctly. The temperature is then brought up to  $102\frac{1}{2}^{\circ}$  and the eggs put in, which will bring the temperature down again, but when it gets up to  $102\frac{1}{2}^{\circ}$ , which it should do in less than half a day, the ventilating holes in the bottom of the machine are opened. The lamp is filled and the char rubbed off (not trimmed) of the wick, and any black incrustation that may have accumulated on the burner scraped off every day; and if the porous brass plate around the wick tube gets fouled up, that must be taken out and thoroughly brushed off.

The eggs are not turned the first two days, but after that they are turned night and morning every day until they begin to pick the shell, excepting the days when they are tested. The heat is not allowed to get above  $103^{\circ}$  during the first week, but during the second week it will naturally rise a little, owing to the animal heat that will begin to develop in the eggs; but if it goes much above  $103^{\circ}$ , take the eggs out, or leave the door open and cool them down again. About the time they begin to pick out, if the heat goes up to  $104\frac{1}{2}^{\circ}$  or  $105^{\circ}$  of its own accord let it remain; but if it goes any higher, bring it back with the regulator, but do *not* open the door.

The chicks are not allowed to drop down into the drawers until they are nearly all hatched, as there is quite a difference in the temperature in the two places, and by keeping them up on the tray until a good part of them are thoroughly dried off and smart, then the smartest ones will come to the front, and so many of them drop down in so short a time that none of them get injured by the change of the temperature, as they keep each other warm. The door is not opened until the morning of the twenty-third day, when they are taken to the brooder, and the machine cleaned up thoroughly and set again.

Before putting the eggs in the incubator, they are all sorted out according to the number on each egg showing the breeding pen that they came from, and a record is kept of how many eggs are set from each pen, so that when they are tested, those that are thrown out can be sorted and set down in another column. The first column has the number of the pens; the second, the number of eggs from each pen; the third, the number of unfertile eggs; the fourth, the number of germs that started, but are dead or "addled" eggs on the first test; the fifth, those that are dead on the second test; the sixth, the eggs that do not hatch; then, by adding all of the eggs that are thrown out from each pen and subtracting them from the number of eggs set in column 2, we have the seventh column, which shows just what each pen of breeders is doing.

If a certain pen's eggs are not fertile, change the male bird at once, giving the first one a rest, when he may be used later on to take the place of another who is becoming exhausted. In changing the male bird, which is one-half of the flock, as far as fertility is concerned, we have done about all we can for this feature, unless it is to change again; for, although it is sometimes argued that the hen may be to blame, or her condition, it is safe to assume that a hen that is in good

enough condition to lay is pretty likely to be in good enough condition to give you fertile eggs; but if the fourth, fifth and sixth columns show that too many of the fertile eggs fail to hatch from any particular pens investigate at once, and see if the flock is healthy, are properly fed and eared for in every way; but if this trouble happens with all of the pens, buy some eggs from some one who is getting good hatches, and then one can easily determine whether it is the fault of the eggs or in the process of incubation. If it is found to be in the incubating, "go for it," and find out, by a systematic plan of experiments, just which of your conditions or what you are doing is wrong. Stick to it, — that very "stick-to-it-iveness" is what has been ascribed as the secret of the writer's success.

Make the first test on the fifth or sixth day, and the unfertile eggs will be in good condition for all cooking purposes, and are worth from one-half to two-thirds the price of market eggs; there is also more room and the eggs can be turned more easily. The second test can be made about the fourteenth day, and if all the dead ones are thrown out, there will be very few if any that will be rotten and smell bad; and by carefully studying the records of both tests, one can keep in touch with just how the process is progressing.

To make a good tester, have a window that faces the sun fitted with a board having a hole in it, the same as any tester, with a piece of felt or leather around this hole, and then darken the rest of the room so that all of the light must come through the egg when placed against this hole. With this arrangement, and a bright sun, no explanation of how to test is necessary, for after one has tested a dozen eggs he can tell as well as any one what is the condition of the eggs.

Under the above conditions the airing or cooling of the eggs is not practised, except when they get too warm, the theory — and it is well borne out by experiments — being that if the room is well ventilated, so that the air is kept good and the proper temperature maintained, the embryo gets all that is needed through the natural circulation that is taking place in this kind of an incubator all the time. On the other hand, if the air is so vitiated that it feels close or "stuffy," and smells strong of the fumes of the lamps, and so that one is glad to get out after staying in there a few minutes (and many of the incubator rooms are in just this condition), and the air in the incubator cannot possibly be any better, in fact, not as good as the air in the room, it is quite likely that a reasonable amount of *airing* is beneficial, but *not* the *cooling*, unless the temperature is too hot. There is no question but that the embryo chick needs oxygen, and that being an accepted fact, it must be far better to give it good oxygen all of the time than to give it inferior oxygen, and in spasmodic doses, at that. It makes quite a difference, too, in what temperature they are aired, as well as at what stage of the process; for to air them considerably where it is not too cold, during the last week, will do no harm, and under some of the above conditions will be of benefit, but to air them during the first week is a great mistake, especially if the temperature is anything but warm.

The writer has been called many times to help poultrymen out of different kinds of trouble, such as, Why do we not get better hatches? Why do so many die in the shell? Why do they die so after we get them in to the brooder? One of the most pronounced cases of the ill effects of airing and cooling was where a party began to air the eggs on the third day, where the temperature of the room was just 50° F., for fifteen minutes, and I think twice per day at that, and this in a room where the ventilation was very good and they did not need



airing at all, and certainly did not need and could not stand the cooling, for out of 8 fertile eggs tested on the seventh day there was but one live germ, and out of several hatches of 30 dozen eggs each he got less than 1 dozen chicks per hatch. Through my advice he stopped the airing scheme, and out of the next hatch he got 108 chicks from 180 eggs, and 43 from the other 180 eggs, and from this experiment he also learned that there was trouble in the flocks that the 43 chicks came from. Now, there is another who has derived more or less benefit since he began to air the eggs, and a comparison of the conditions will easily show why. In the first place, the ventilation is not near as good as that of the first party, and then if the room is too cold he has a little stove to warm it up. This is all now on the cooling practice, but when we come to the brooding and rearing of the chicks I will refer to it again.

To illustrate the difference in conditions, I will quote from one more of my visits, where the party was not satisfied with his hatches. He had an incubator cellar, stoned up to the roof, with three small windows, about 10 by 20 inches on each side, but those on the lee side were the only ones that were ever opened, and those only a little at the top, and this was all the ventilation there was; there was also a cement floor, which made it very dry. In this room there were some 18 incubators, and, while everything was kept nice and clean, one was very glad to get out and get a good breath of fresh air. The same party had 6 incubators in a very damp cellar, with not much provision for ventilation, but it was very large and roomy, and he had not taken off any hatches from these machines; but the writer told him at once that this was the place to hatch chickens, the other place was too close, too chocky and too dry, and it proved just so. So it is very plain that one must learn just what is best to do under his own conditions. This is not to be construed that one is not to get other people's ideas, either verbally or through the papers, — do so by all means; but also learn what their *conditions* are, then take them home and apply them if necessary.

In the artificial rearing of chickens by the amateur there are many obstacles if he undertakes to work them all out himself; but if he so elects, he has many advantages over the beginner of fifteen or twenty years ago, because where he has a chance to imitate, the other had to feel his way in the dark and make many costly experiments; and even now, while there are plenty of parties that are successful in this business, making a good thing out of it, it is very doubtful if there is one single party that is all through experimenting and trying to do better, which simply shows that there is still chance for improvement.

The first requisite in the artificial raising of chickens is the brooder; and when one considers that the most important factor that brought the chicken into this world as a living being was *heat*, and that that heat had to be about right in order to produce a strong, healthy chick, it will be easy to understand that the temperature in the brooder must be about right to have the chicks live and do well, because that important factor does not cease as soon as the chick gets out of the shell but remains in full force for several weeks. No one would think of taking a little chick out of an incubator, where the temperature is above 100°, and turning it loose to shirk for itself with no old hen to cuddle up to, to warm itself; so it was necessary that some way be devised to supply the proper heat. But the next question is, What is the proper temperature, and how shall we provide it? The writer works on the plan that, if there is a suitable place provided that is a little *too* warm, and if the temperature is gradually and continuously



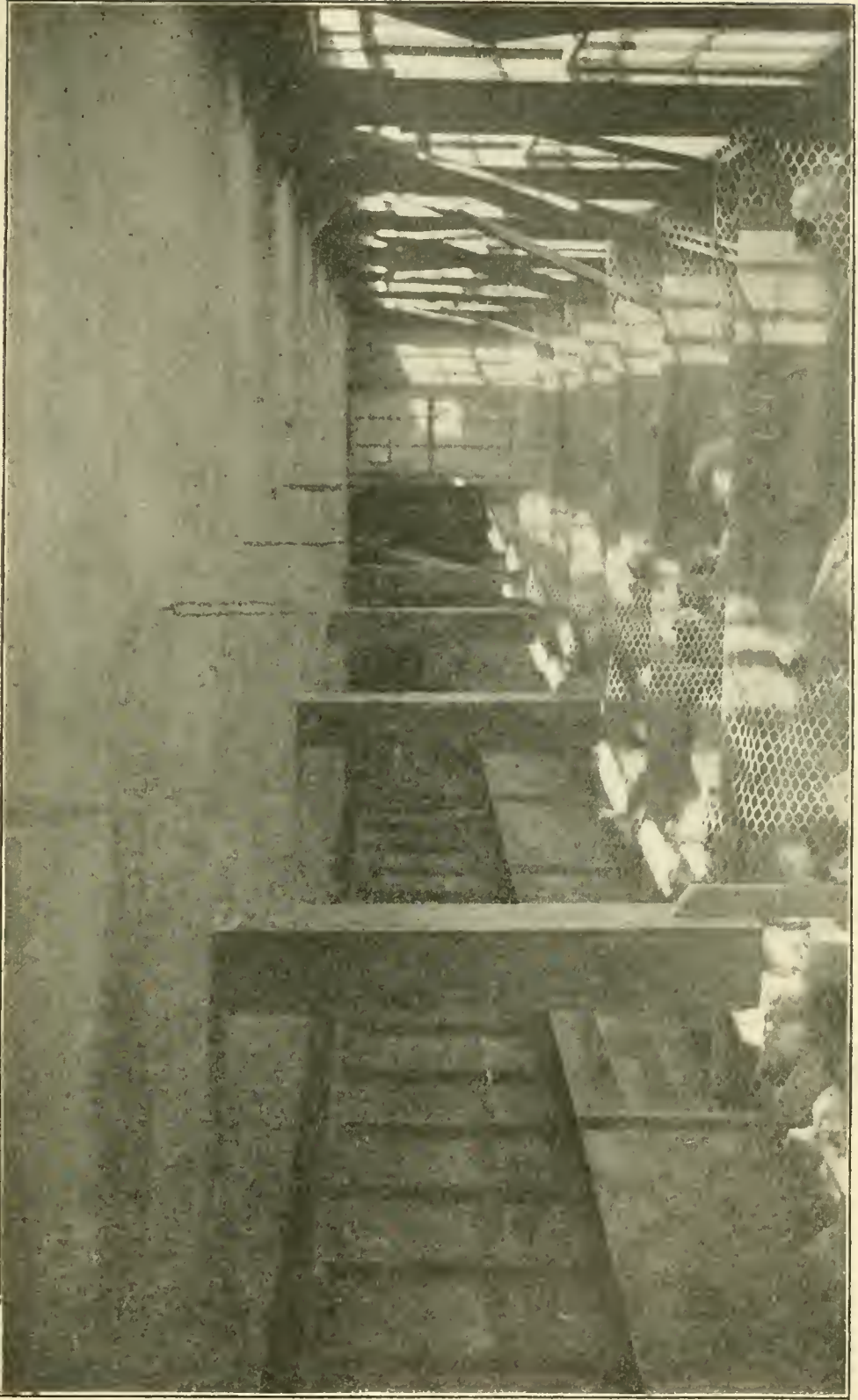


PLATE 1.—Interior of Brooding House.

decreased to a place that is *too* cool, the chick will instinctively find the place that is just right, providing it is healthy.

Plate 1 shows the interior of a 60-foot brooding house. It is 14 feet wide, 6 feet 3 inches high between a cement floor and plastered ceiling, has a walk on the north side 33 inches wide, and is divided into 10 pens, with a window of 9 by 13 glass to each pen on the south side. There is a ventilator 7 inches square over either dividing fence, making 5 in all, which just reaches through the ceiling, then the space above the ceiling has two ventilators 16 inches square out through the roof. The board partition between the walk and the pens is 30 inches high, and just in front of this are the hot-water pipes and in front of these are the return pipes. These pipes run the whole length of the house through the pens, and are 6 inches above the cement floor; they are supplied from a heater that is at one end, down in a pit that is  $4\frac{1}{2}$  feet deep and about 7 feet square. An even temperature is maintained by an electric regulator that will open and close the drafts automatically, within  $1^{\circ}$  of a given point; and if for any reason the temperature gets too hot or too cold, it rings a bell in the attendant's room. For instance, the fire may get low, or a door blow open, or a window drop down, or the attendant may neglect to wind up the machine, etc., but with this arrangement he is notified before any damage is done.

Coarse sand or fine gravel is put all over the floor and up to within 2 to 3 inches of the pipes, and the temperature in this space under the open pipes is kept at  $90^{\circ}$  F.; but for the first ten days there is a cloth frame 30 inches square laid over one end of the pipes in each pen, for the little chicks to have a place where there is no draft, and the temperature will run up to from  $95^{\circ}$  to  $97^{\circ}$  under this cloth, with the temperature at  $90^{\circ}$  under the open pipes as above. This makes a place that is a little too warm, and as the chicks grow older, so that they do not need so hot a place, they will work out under the open pipes, where it is  $90^{\circ}$ ; and when this is too warm they work out under the returns and from here just out in front of all the pipes, and so on by their own instinct finding the heat that just suits them, and there is no incline or stairs for them to learn to climb, or stay out and get chilled, but the whole width of the pen is heated, and is wide open for them to go where they please. During the first four days there is a board put clear across the pen about 1 foot in front of the pipes, and wide enough to reach from the sand up to 3 to 4 inches higher than the pipes; this prevents an undercurrent of cold air from drawing in under the pipes, right onto the young chicks, which is more than they can stand. As the heat is generated in the pipes, and rises at once, the cold air rushes in to take its place, hence this undercurrent. After the first four days this board is moved away a little every day until about the seventh day, when it is taken away entirely. In one of these pens, 6 by  $11\frac{1}{2}$  feet, are put from 100 to 125 chicks right from the incubator, and they are kept there until they are feathered out enough to go out to the colony houses, where there is no heat.

The little chickens are fed sparingly, yet enough, five times per day at first, with any good mixture of fine grains and seeds that has a good variety, such as the Cyphers Chick Feed, scattered all about, and a dry mash composed of two parts of bran and one part of Indian meal, and a few beef scraps. The dry mash and beef scraps are fed on a board 12 by 24 inches, with a lath tacked around the edge. Then of course they must have plenty of good water, and if the sand is right they will get what grit they want out of that, and they must have some sort of green stuff, it does not matter much what, so long as they eat it. Under the above arrangement they have the whole run of



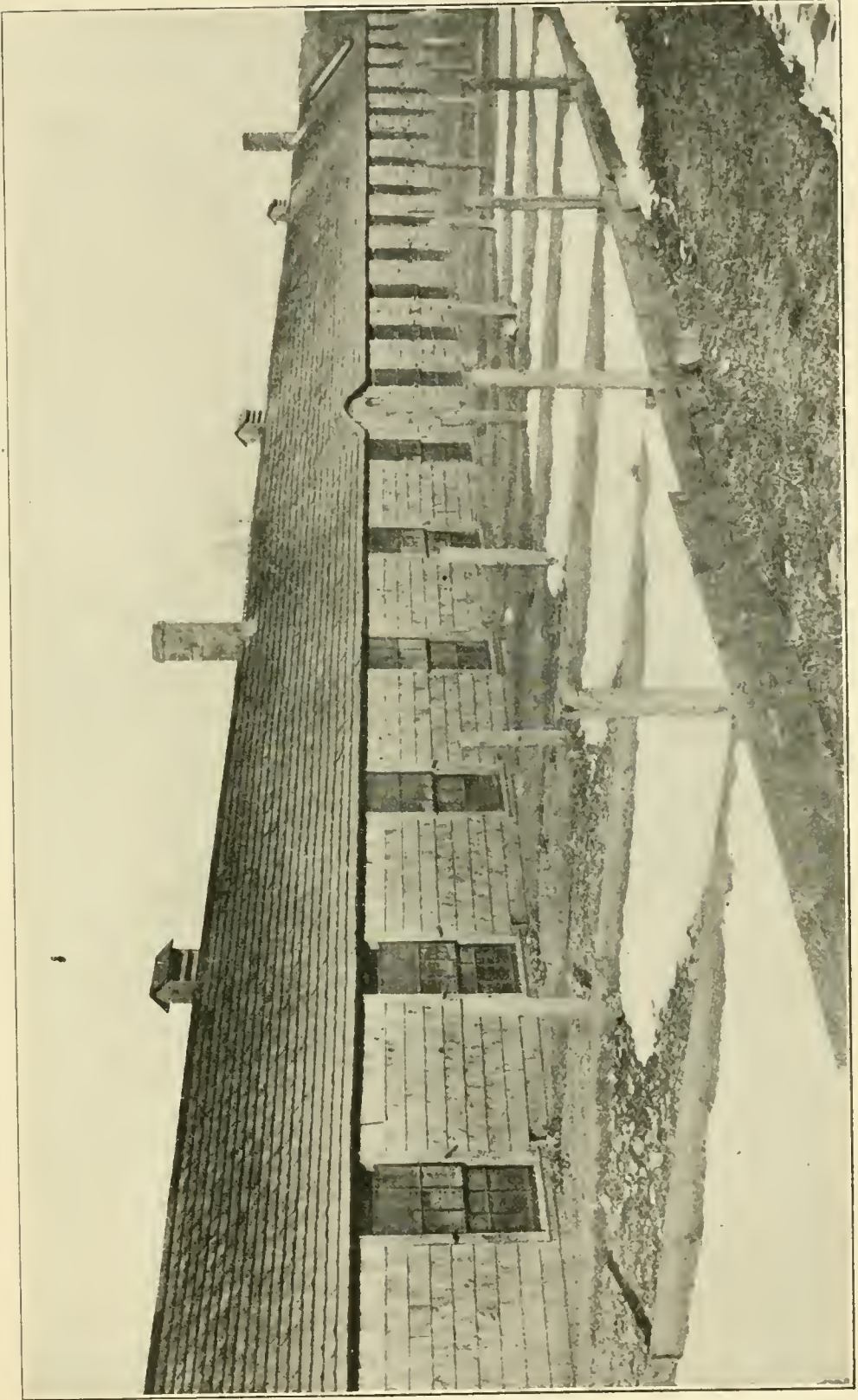


PLATE 2. — Outside of Brooder House in Winter.

the pen after they are a week old, and then the first fair day they are allowed to go out doors a little while each day, and in a few days more, according to the weather, all day.

Plate 2 shows the outside of the brooder house in the winter time, with the windows dropped a little at the top, opposite the pens that have the oldest chicks. Plate 3 shows the colony houses, with snow on the ground also, and they have 6 by 8 foot sills, with a front of 5 feet and the back 3 feet high. There is a self-feeder inside that holds a bag of cracked corn, a box for scraps, another for shells and grit, and a one-half size bucket for water. Fifty chicks are put into each, right from the brooder, and kept there until they are sold as roasters, having a run large enough so that they do not kill the grass.

One of the greatest obstacles in the rearing of chickens artificially is what is known as the "white diarrhoea," and the writer had it here for years, but not for the last three seasons. If the temperature during the whole process is kept where it should be, from the time the eggs are put into the incubator until the chicks are three to four weeks old, there will be no "white diarrhoea." If one will notice how the chicks are taken down, it will be found that they do not eat as much as they should, but drink a great deal of water, which shows that they are feverish, and this is either caused by a lack of sufficient warmth or because they have been chilled.

Then comes the question of what is the proper heat in all of the different stages of the process; and about this time there is another element that enters in, and that is, if a chick comes into the world in a good, strong, vigorous condition, it can stand considerable ill treatment; but if it is not very strong, perhaps has not had just the right heat in the incubator, or the old stock was not just right, and yet it is possible to raise it, *with the right kind of treatment*, it must have a chance to get where it is warmer, if it wants to. The cooling process referred to under the head of incubation can be carried to such an extreme that will produce just this trouble, and then there are several ways by which it can be brought on in the brooder. One way is to run the heat too low all of the time, and in this last case it need not be much too low, either; then it may be run warm enough practically, but the fire goes out, and the longer it remains out and the lower the temperature goes the more likely they are to receive the chill necessary to bring on this trouble; and again, the younger the chick the greater the danger. Then there are brooders that are so constructed that the little chicks do not know enough to find the place where the proper heat may be, after they are once let out; and one will often see them in various numbers, huddled up in some corner trying to keep each other warm, which means white diarrhoea in a few days. In this last instance it may happen that only a few get chilled, and they may be the only ones to have it; then, if the party has used some concoction as a remedy, he may think that the remedy was what cured the rest of the lot, when as a matter of fact they never had it at all. So the best remedy is to give them a chance to go to any temperature they want, and so arranged that the little chicks right out of the incubator cannot help finding it, — in other words "fool proof."

The question is often asked, "Is there a chance for me to get a living in this artificial chicken business?" The reply is, "There certainly is," for the right party; and there are very few if any other kinds of business that offer as large returns for the amount of capital invested. But when the question is asked, "Can I make a living at it?" it is quite another thing, for no one can tell another whether he can make a success if he goes into any kind of business, — chickens, dairying,



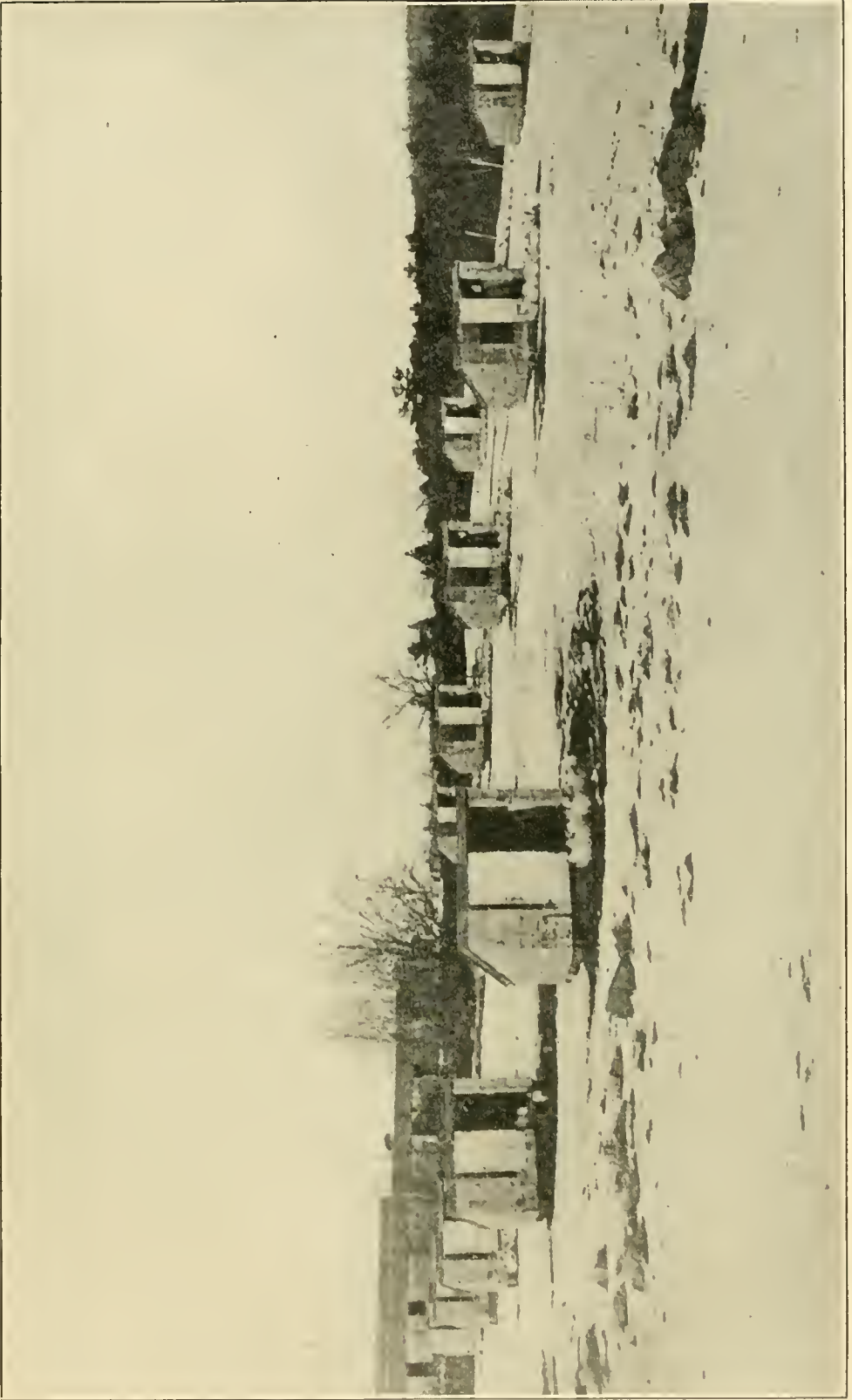


PLATE 3.—Colony Houses in Winter.

sheep raising, manufacturing shoes, stockings or watches, because so much depends on the person himself. If one has but little capital, he must work, and work hard, until he gets everything to do with, then it will go along very easily; but if one has money enough to hire all the hard work done, of course it is just so much easier.

There is one thing that would be of inestimable value and help to the poultrymen of this State, and that is, to have a Massachusetts Poultry Association, one such as every one who is interested in any branch of the business, and even their friends, would be glad to join, that we might work together for the common good of the whole poultry fraternity. For an idea of the many things that might be accomplished, the reader is referred to the Connecticut Poultry Association, which has done and is doing a great deal for this important industry in that State. With a good, strong organization of this kind, we could go before the Legislature and expect to accomplish any reasonable object that we might desire; in fact, we could force the recognition that an industry of such proportions as this rightly deserves.







MASSACHUSETTS  
CROP REPORT

FOR THE

MONTH OF SEPTEMBER, 1908.

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RENOVATING OLD ORCHARDS.

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*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF  
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary*

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ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,  
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# CROP REPORT FOR THE MONTH OF SEPTEMBER, 1908.

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OFFICE OF STATE BOARD OF AGRICULTURE,  
BOSTON, MASS., Oct. 1, 1908.

Bulletin No. 5, Crop Report for September, is herewith presented. The article in this month's issue is on a subject which has been in our minds for some time. The great number of neglected apple orchards and apple trees in the State is a source of great loss to our farmers each year, when we compare the returns received from them with what could be obtained with careful and reasonable treatment. Believing that there are many farmers who would be glad to bring these trees and orchards to good bearing condition if the way were pointed out, we include an article on "Renovating Old Orchards," by Prof. F. C. Sears, professor of pomology at the Massachusetts Agricultural College. Though the subject is treated from the standpoint of the orchard, everything included in it is equally applicable to the neglected single tree in the fence corner or beside the road.

## PROGRESS OF THE SEASON.

The monthly report of the Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for September, 1908) shows the condition of corn on September 1 to have been 79.4, as compared with 82.5 a month earlier, 80.2 on Sept. 1, 1907, 90.2 in 1906, and a ten-year average of 81.

The average condition of spring wheat as harvested was 77.6, as compared with 80.7 on August 1, 77.1 in 1907, 83.4 in 1906, and a ten-year average of 77.9.

The condition of the oat crop when harvested was 69.7, as compared with 76.8 on August 1, 65.5 in 1907, 81.9 in 1906, and a ten-year average of 80.7.

The average condition of barley when harvested was 81.2, as compared with 83.1 on August 1, 78.5 in 1907, 89.4 in 1906, and a ten-year average of 83.5.

The preliminary estimate of the acreage of rye harvested is 1.9 per cent less than last year; the preliminary estimate of yield per acre is 16.4 bushels, as compared with 16.4 bushels per acre harvested last year, 16.7 in 1906, and a ten-year average yield of 15.8 bushels. The indicated total production is 30,921,000 bushels, as compared with 31,566,000 bushels last year. The quality of the crop is 92.7, as compared with 91.6 last year.

The average condition of buckwheat on September 1 was 87.8, as compared with 89.4 a month earlier, 77.4 in 1907, 91.2 in 1906, and a ten-year average of 86.5.

The average condition of potatoes September 1 was 73.7, as compared with 82.9 a month earlier, 80.2 in 1907, 85.3 in 1906, and a ten-year average of 80.8.

The average condition of tobacco on September 1 was 84.3, as compared with 85.8 a month earlier, 82.5 in 1907, 86.2 in 1906, and a ten-year average of 83.7.

The condition of the apple crop on September 1 was 52.1, as compared with 52.2 a month earlier, 34.7 in 1907, 70.6 in 1906, and a ten-year average of 54.7.

The preliminary estimate of the yield of hay is 1.52 tons per acre, as compared with 1.45 tons last year, 1.35 tons in 1906, and a ten-year average yield of 1.44 tons. The indicated total production is 67,743,000 tons, as compared with 63,677,000 tons last year. The quality of the crop is 94.5, as compared with 90.5 last year.

In Massachusetts the average condition of corn on September 1 was given as 95; the average condition of oats when harvested as 95; the average condition of potatoes on September 1 as 69; the average condition of tobacco September 1 as 94; the average condition of buckwheat September 1 as 85; the yield per acre of rye as 16.5 bushels, the production of rye as 59,000 bushels, and its quality as 94; the yield per acre of hay as 1.20 tons, the production of hay as 702,000 tons, and its quality as 97.



## TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM THE NATIONAL WEEKLY WEATHER BULLETIN.]

*Week ending September 7.* — The mean temperature was slightly above the normal over the entire region between the Mississippi valley and the Rocky Mountains. Over the entire Rocky Mountain, Plateau and Pacific coast districts the temperature was above the normal. The temperature was below normal along the Atlantic coast from southern New England to the Carolinas, and over the Appalachian region from Maryland to northern Georgia and in southern Florida. The week was generally one of very light precipitation, except along the immediate Atlantic coast from North Carolina to southern New England, where good rains occurred during the early and latter parts of the week. Over the west Gulf States, the Mississippi and Ohio valleys, Lake region, western Pennsylvania and New York, and the greater part of New England, the precipitation was markedly deficient. Practically no rain occurred over the upper Missouri valley, the Rocky Mountain, Plateau and Pacific coast districts.

*Week ending September 14.* — The mean temperature continued above the normal over the districts between the Mississippi River and the Rocky Mountains, and the area of excess extended westward to the Pacific and eastward to the Appalachian Mountains and New England, embracing all of the United States except a narrow strip along the Atlantic coast from southern New Jersey to Florida, and a few points on the Gulf coast. The week was practically rainless over the entire region from the Rocky Mountains eastward to the Atlantic, except for local showers along the Atlantic coast from Virginia to Florida, over the southern portion of the Gulf States, central and northern Texas, portions of western Arkansas, and at a few points in western South Dakota, central Minnesota and southern Wisconsin.

*Week ending September 21.* — The mean temperature for the week was abnormally high over all the interior districts of the United States, making the fourth consecutive week of this condition. Over the central valleys and the Lake region

the excess ranged from  $3^{\circ}$  to  $15^{\circ}$ . The mean temperature continued below the normal, as in the three preceding weeks, over the middle and south Atlantic coasts, and was slightly below normal over the northern portions of New England and New York. Practically no rain occurred over the greater part of the Missouri, Mississippi and Ohio valleys, Lake region, New England, the Atlantic coast districts and the northern portion of the Gulf States, also over the Rocky Mountain, Plateau and Pacific coast districts. Showers occurred over the southern portions of the Gulf States, portions of Texas, Oklahoma, Arkansas, Kansas and southern Nebraska.

*Week ending September 28.* — The mean temperature continued abnormally high over the Lake region, making the fourth consecutive week of such conditions. Temperature was above normal over all districts from the lower Missouri and Mississippi valleys eastward to the Atlantic, with daily departures from  $9^{\circ}$  to  $15^{\circ}$ . Cold weather from the 26th to the end of the week lowered the mean temperature of all districts from the Great Plains westward to the Pacific, departures in these districts ranging from  $3^{\circ}$  to  $9^{\circ}$  below. The week continued practically without rain over the lower Lake region, the upper Ohio valley, and thence eastward and northeastward over the northern portion of the Middle Atlantic States and New England. Local showers began in the western districts early in the week and extended eastward, so that all other districts had come within the rain area, with rain still falling at the close of the week in the Middle Atlantic States.

#### SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

*Week ending September 7.* — New England. Boston: Fair, pleasant weather prevailed through the week, except light showers on the 3d and 6th; more rain needed. Precipitation for the week was generally below normal. The temperature for the week was generally seasonable, except on the morning of the 4th, when frosts occurred in many localities. Sunshine abundant.

*Week ending September 14.* — New England. Boston: No rain occurred during the week; ground very dry and dusty; springs and streams low; rain greatly needed throughout the section; drought in Vermont is stated to be the most severe for years. Temperature was above the normal, with unseasonably warm days. No cloudiness during the week, although it was very smoky on the 10th, 11th and 12th.

*Week ending September 21.* — New England. Boston: No rain occurred during the week; the drought continues with increasing severity; the wells and streams are drying up, and in some localities much inconvenience is being experienced from the lack of water. The average temperature was slightly below the normal. The days were generally warm and the nights cool. The minimum temperatures of the 15th and 16th were near the freezing point, with frosts, in a large part of the section. Sunshine was above the average. The 17th and 18th were very smoky.

*Week ending September 28.* — New England. Boston: The temperature was much above the normal. No rain occurred during the week; very dry; drought continues with increasing severity throughout the section; least rainfall this month of any month for years in the greater part of New England. Sunshine was above the average.

#### THE WEATHER OF SEPTEMBER, 1908.

The weather of the month was very dry, with temperatures normal to somewhat above. The conspicuous feature of the weather conditions was the prevalent and very severe drought, that began with the closing week of August and continued, with slight local interruptions, till the 28th of September. Showers fell in coast sections on the 2d and the 6th, after which there was no rain till the night of the 28th, when general showers, that gave moderate to heavy amounts, occurred. Owing to the long-continued absence of rain the atmosphere became heavily laden with smoke from forest fires and with dust. At times the sun was wholly or partially obscured by the accumulated smoke and dust. The wind movement was considerably less than usual, and the per cent of humidity generally excessive, which resulted in much



oppressive and unseasonable weather. The temperatures were without marked extremes. The days, generally speaking, were warm, while the nights were correspondingly cool. The highest temperature of the month occurred generally on the 10th or the 11th, when the mercury ranged near 90° or above. The temperatures were lowest on the 15th and the 16th, when frosts occurred in some localities. The month closed with cool weather on the night of the 29th and during the 30th. The warm sunny weather of the month was very favorable to the maturing, harvesting and housing of crops, and to outdoor pursuits generally. It was, however, injurious to grass lands, and to pasturage for fall feed.

In the circular to correspondents returnable to us September 26 the following questions were asked:—

1. How does the crop of Indian corn compare with a normal crop?

2. Are the rowen crop and fall feed up to the usual average?

3. Has the usual amount of fall seeding been done, and what is its present condition?

4. How does the onion crop compare with a normal crop?

5. How do potatoes compare with the normal in yield and quality?

6. What is the prospect for root crops, celery and other late market-garden crops?

7. How have apples, pears, peaches, grapes and cranberries turned out?

Returns were received from 138 correspondents, from which the following summary has been compiled:—

#### INDIAN CORN.

The corn crop was a remarkably good one in almost all sections, one of the best ever secured, both for grain and stover. Practically matured early in the month, it escaped the consequences of the severe drought of September, the only effect of the hot, dry weather of this month being to cure the stover rapidly in the stooks, and to still further mature the ears on that portion of the crop grown for ensilage.



There was a little damage from frost during the first few days of the month, but this was not sufficient to affect the crop as a whole. Some few correspondents report that the crop did not ear well, or that the ears are not well filled out, but here again the reports are so few as to indicate that these shortcomings are confined to very limited areas.

#### ROWEN AND FALL FEED.

Rowen was generally a light crop on all but the heaviest and moistest fields. As this happens in about four years out of five, it would be a mistake to say that the crop was less than an average one, but it was certainly considerably under the normal. The drought did not particularly affect it, except to do away with the possibility of late growth to make up for the earlier deficiency. Feed in pastures was reported as very short, the long-continued dry, hot weather having operated to dry it up in many cases, and cows were generally being fed at the barn considerably earlier than usual.

#### FALL SEEDING.

The drought has prevented anything like the usual amount of fall seeding having been done. That which was put in in August seems to have germinated well, and is reported as in good condition, though it is doubtful if it can have made any appreciable growth during the past three weeks, and will probably show the effects of the drought in the crop next year. That sown in September has, of course, failed to germinate as yet, the seed lying dormant, awaiting the rains. What the germination would be in the event of abundant rains is uncertain, but it must have been injured materially. It is not probable that anything like the usual amount of seeding will be done this fall, even when the rains come.

#### ONIONS.

Onions are generally reported to be a good crop, particularly in the Connecticut valley. There was some damage from thrips in that section, but this was not as serious as the growers anticipated earlier in the season. One correspond-

ent, in a principal onion growing town, reports that yields of from five to six hundred bushels per acre are not uncommon, while some fields show eight hundred bushels per acre. There are some complaints of small size, particularly in eastern sections, but this complaint is not general.

#### POTATOES.

Potatoes are estimated at from one-third to one-half of a normal crop. Only occasionally does a correspondent report more than the latter figure. Blight and the early drought seem to be the principal causes of the shortage, there being little complaint of rot. Many correspondents report that the tubers are large and fair, but very few in the hill. The quality of the crop is generally good, and the continued fair weather has allowed it to be harvested earlier and more advantageously than usual.

#### ROOT CROPS, CELERY, ETC.

Root crops are hardly up to the normal, owing to the continued drought, which has checked their growth. Cape turnips have perhaps done fully as well as root crops in other sections, and promise a fair crop. Celery is hardly up to the normal, so far as reported on, though it may improve with plentiful rains. Late market-garden crops are growing slowly, because of the drought, and do not promise well as a whole. Squashes are generally reported as an excellent crop, and, indeed, vines of all kinds appear to have done well this season. Late cabbage will be a light yield in most sections.

#### FRUIT.

Apples are a light crop, and ripened prematurely in many cases because of the dry and hot weather. They are small in many instances, particularly the winter varieties, but are generally reported as fair and free from insect damage. Pears are a rather better yield than was expected, and are reported as being of very fine quality. Peaches are a light crop, except in a few localities, many sections showing none

at all. Grapes are generally a heavy crop and have matured with almost no damage from frost. Cranberries are a light crop, particularly on the Cape and adjoining districts, where the bulk of the crop is produced. The berries appear to be smaller than usual, the vines did not set as well as they should, and there is more or less damage from insects.

## NOTES OF CORRESPONDENTS.

(Returned to us September 26.)

## BERKSHIRE COUNTY.

*New Marlborough* (E. W. RHOADES). — There is more than an average crop of corn. Rowen and fall feed are more or less short. Fall seeding is delayed on account of drought, and probably but little will be done this fall. There are only a few onions raised, but the crop is good. Potatoes are below the normal in yield and quality, with the exception of a few fields. Root crops look well, as do also late garden crops. The apple crop is uneven; pears and grapes are abundant.

*Alford* (L. T. OSBORNE). — Indian corn is the best crop for some years. Rowen is much below the average and fall feed has suffered from the dry weather. About the usual amount of fall seeding has been done, but much of it has not come up as yet. There will not be over a three-fourths crop of potatoes. Apples are 25 per cent below the average in yield; pears, peaches and grapes are fine crops.

*West Stockbridge* (J. S. MOORE). — The corn crop is much better than usual, the season having been very favorable for it. Rowen is not up to the usual average; we have had no rain since August 26, and fall feed has suffered. The usual amount of fall seeding has been done, but the continued dry spell has kept it at a standstill. No onions are raised to speak of. Potatoes are not up to the normal, being of small size, but bring fair prices. Root crops and late market-garden crops are only grown for home use. Apples are not as plenty as usual; pears very plenty; other fruits not grown. The continued dry weather has cut off fall feed and in some cases the entire water supply.

*Stockbridge* (F. A. PALMER). — Indian corn is above a normal crop. Rowen and fall feed were up to the average, but have suffered from drought. Less than the usual amount of fall seeding has been done. Potatoes are far below the normal, owing to blight. Apples are 60 per cent of a normal crop; pears 80 per cent; grapes 90 per cent. A little rain would change the looks of all vegetation for the better.

*Becket* (WM. H. SNOW). — Indian corn is a full average crop and has ripened well. Rowen and fall feed have been up to the usual average, but the dry weather begins to tell on fall feed. Less than



the usual amount of fall seeding has been done. Onions are little raised. Potatoes are a light yield, and the quality is not as good as usual. The prospect is good for root crops, celery and late market-garden crops. Pears, peaches, grapes and berries turned out well, but apples are a light crop, not over half a crop.

*Washington* (E. H. EAMES). — Indian corn is about the same as in former years. Rowen and fall feed are not up to the usual average. Less than the usual amount of fall seeding has been done. Onions are raised only for home use. Potatoes are a good yield, but there is some rot. Root crops, celery and other late market-garden crops are not raised for market. Apples and pears are half crops; other fruits not raised.

*Windsor* (HARRY A. FORD). — The corn crop is equal or better than the normal. There is very little rowen or fall feed. Not much fall seeding has been done and that put in has not germinated as yet, owing to dry weather. Potatoes are a good crop, though not quite up to the normal. Apples are very scarce.

*Cheshire* (L. J. NORTHUP). — Indian corn compares very favorably with a normal crop. On account of the long-continued dry spell the rowen crop is not up to the average. The amount of fall seeding done is much less than usual, but it will no doubt be done as soon as rain comes. The onion crop is said to be a normal one. Some fields of potatoes are very good, but on the whole the crop will be light. The prospect for root crops is not at all promising. Apples are half a crop; pears, peaches and grapes are turning out well.

*New Ashford* (WALTER F. SMITH). — Indian corn is about an average crop; ears rather small but sound. Owing to the drought there is neither rowen nor fall feed. No fall seeding has been done as yet, because of dry weather. Onions are about an average crop. Potatoes are of very good quality, but are about half a crop in yield. Root crops, celery and other late market-garden crops are not raised. There are very few apples; pears and grapes are above the average. Squashes and other vines have done well, as have also tomatoes. This has been a hard year for our farmers, as we have had to feed our cows at the barn most of the time, owing to dry weather.

## FRANKLIN COUNTY.

*Charlemont* (J. M. J. LEGATE). — The corn crop is much above the average. Perhaps the rowen crop was up to the average, but fall feed is much below. Very little fall seeding has been done, and any that has been put in must have failed to germinate. Onions are a good crop, above the average. Potatoes are of good size and quality, but much below the average in yield. Root crops and late market-garden crops are little raised. Apples and pears are fair crops. We have had no rain since the 27th of August and all late crops have suffered terribly.

*Leyden* (FRANK R. FOSTER). — Indian corn is fully up to the average. Rowen was not more than a two-thirds crop, owing to dry weather. The usual amount of fall seeding has been done and it had a good start, but is now somewhat affected by dry weather. The yield of potatoes is light. There is an abundance of pears, some peaches, and fall apples are plenty, but winter apples are scarce. The season is the driest ever known. Grasshoppers have eaten nearly all pasture feed.

*Gill* (F. F. STOUGHTON). — The corn crop is an average one. Rowen was an average crop, but fall feed is poor, owing to drought. The usual amount of fall seeding has been done, in corn mostly; potatoes are a poor crop. Early apples are a good crop, but late apples will give a light yield.

*Ashfield* (ALBERT HOWES). — Ensilage corn is above average, but there is some complaint of ears not filling out well where raised for grain. Rowen and fall feed are a little above the average. Less than the usual amount of fall seeding has been done, because of lack of rain, and it is in poor condition. There are few onions raised here and the crop seems to be light. Potatoes are below the normal both in yield and quality. Root crops, celery and other late market-garden crops are not much raised, but promise well. Apples are hardly up to the average; other fruits turned out well. There are a few sales of winter apples at \$1.75 per barrel.

*Conway* (L. T. HOPKINS). — Indian corn is fully an average crop. Rowen was better than usual, but fall feed is drying up. About the usual amount of fall seeding has been done, but it is too dry for it to germinate, except slowly. Onions are not raised in this section. Potatoes are a light yield, small in size and of good quality. Apples are of poor quality and a light yield; pears good; peaches a light yield but of good quality; grapes good, with more than an average yield; cranberries not grown.

*Whately* (C. L. CRAFTS). — Indian corn is a better crop than usual. Dry weather has checked rowen and fall feed somewhat, but they are in fair condition. Very little fall seeding has been done. Onions are an excellent crop, the yield being heavier than usual. Potatoes are a very poor crop, both in yield and quality. The prospect is very good for root crops and late market-garden crops. The fruit crop is fine, with the exception of apples, the apple yield being light, owing to dry weather. The continuous dry weather has affected all crops. The past few days we have had a heavy fog at night, which is good for curing tobacco.

*Sunderland* (GEO. P. SMITH). — Indian corn is a normal crop or better. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and looks well on moist land, but is killed out by dry weather somewhat on dry land. Onions are a very good crop, from five to six hundred bushels to the acre, with an occasional yield of eight hundred bushels. Potatoes are much below a

normal crop. Root crops are not much grown; celery and cabbage good crops. There are not many apples; pears and grapes plenty. Onions are selling at from 40 to 45 cents per bushel. There has been a fine curing season for tobacco, and there is no pole sweat.

*Erving* (CHARLES F. CLARK). — Indian corn compares favorably with the normal. Rowen and fall feed are a little below the usual average. About the usual amount of fall seeding has been done, and is greatly in need of rain. Onions are not raised here. Potatoes are below the normal in yield. The prospect is fair for root crops, celery and other late market-garden crops.

*New Salem* (DANIEL BALLARD). — The corn crop is fully up to the normal. Rowen and fall feed are less than the usual average. There has been but little fall seeding as yet, and what has been done needs rain. Potatoes are below the normal in yield, but of fair quality. But little is done here with root crops, onions, celery and late market-garden crops. There is a fair yield all round of fruit. This has been an extremely dry September, the roads are beds of dust, brooks are low and many wells have failed.

## HAMPSHIRE COUNTY.

*Prescott* (W. F. WENDERMUTH). — Corn is a good average crop, perhaps above the average. Rowen was a fair crop, but fall feed is very poor and short. Scarcely any fall seeding has been done. Onions are not grown here. Potatoes are not more than half a normal crop, but are of fair quality. Root crops, celery and other late market-garden crops are not grown to any extent. Apples are from 70 to 80 per cent of a normal crop; pears fair; grapes good; other fruits little grown. Apples have ripened early, and, owing to continued drought, have fallen badly. Many smaller streams are dry, and the same is true of wells and springs.

*Enfield* (D. O. CHICKERING). — Indian corn is a good crop, above the average. Rowen and fall feed are not up to the usual average. Very little has been done in fall seeding. Onions are not raised to any extent. Potatoes are about half an average crop, except on low land, where they are good. There will be about half a crop of apples; pears good; peaches and grapes about average.

*Belchertown* (H. C. WEST). — The crop of Indian corn is one of the best for years. Rowen was a fair crop, but fall feed is feeling the dry weather. The usual amount of fall seeding has been done, and is looking fairly well. No onions are raised hereabouts, but plenty are offered for sale. Potatoes are a two-thirds crop in yield and of good quality. The prospect is fairly good for root crops and late market-garden crops if we have rain soon. Fruits are from one-half to two-thirds crops, except pears, which were nearly an average yield. All late crops will be short unless we have rain soon.



*Amherst* (WM. P. BROOKS). — The corn crop is exceptionally good and unusually well ripened. Rowen and fall feed are much below the normal in most cases on account of drought. Less than the usual amount of fall seeding has been done, because of drought; that seeded early in corn is in good condition on soils of fine texture. The total crop of onions is probably above the average, but on some fields is poor on account of thrips. The yield of potatoes is light in most cases on account of blight and dry weather. The prospect for root crops, celery and other late market-garden crops is generally fairly good. Apples have fallen badly, and the yield will be small and quality poor; pears average; peaches a moderate crop; grapes unusually good. Tobacco is curing well, with no pole sweat. Rain is very much needed.

*South Hadley* (W. F. PERSON). — Indian corn is better than was expected. Rowen is up to the average. Fall seeding is backward, on account of the dry weather. Onions have yielded fairly well. Potatoes are about half a crop, of good quality. Late garden crops are suffering from lack of rain. Apples are about half a crop; pears are a good crop in yield and quality. All kinds of farm produce give light yields and good prices.

*Southampton* (C. B. LYMAN). — Indian corn is about a normal crop. Rowen was about an average crop, but the dry weather has made fall feed short. The full amount of fall seeding has been done, but it is not starting very fast, because of want of rain. Onions are rather more than a normal crop. Potatoes are about half a crop, but the quality was never better. The prospect is fairly good for root crops, celery and other late market-garden crops. Apples are light; pears few and grapes plenty.

*Westhampton* (LEVI BURT). — Indian corn is fully up to the normal. Rowen was about two-thirds of a normal crop, but fall feed is all dried up. The usual amount of fall seeding has been done and is in excellent condition. Potatoes are half a crop and small, but of good quality. Root crops, onions, celery and other late market-garden crops are not raised to any extent. Apples are large and fair, not over half a crop in yield; some varieties of pears full crops and of good quality; peaches and grapes but little raised.

*Chesterfield* (HORATIO BISBEE). — Corn is a fine crop and well ripened. Rowen is light and there is but little feed in pastures. On account of continued dry weather there has been but little fall seeding done. The potato crop is very uneven, some fields yielding well, while others are light; quality good; late-planted fields generally show the best results this year. Apples are a light crop, of fine quality.

*Goshen* (ALVAN BARRUS). — The continued drought has reduced the corn crop somewhat. Rowen and fall feed are far below the average. Very little fall seeding has been done, owing to dry weather. Onions are not raised to any extent. Potatoes are very uneven, a few fields



good, others hardly worth harvesting. Root crops, celery and other late market-garden crops are making a fair showing. Apples are ripening prematurely; pears normal; other fruits a little below normal.

### HAMPDEN COUNTY.

*Chester* (C. Z. INZELL). — Indian corn is about a normal crop. Rowen is better than last year, but has suffered from drought. Potatoes are less than a normal crop, but are of good quality. Apples are a light crop.

*Russell* (E. D. PARKS). — Indian corn is fully up to the average. The rowen crop was good, but fall feed has dried up. The usual amount of fall seeding has been done, but it is not doing well, owing to drought. Onions are little raised. Potatoes are of good quality, but rather below the normal in yield; very little rot reported. Pears are very good; few apples; other small fruits about average.

*Agawam* (J. G. BURT). — The crop of Indian corn is a good one. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done, but is in need of rain. There is a light crop of onions. Potatoes are a good crop in quantity and are of good quality. The prospect is for light yields of root crops, celery and other late market-garden crops. Fruit of all kinds gives good yields, with the exception of apples.

*West Springfield* (N. T. SMITH). — The corn crop is about 80 per cent of the normal; stalks large, but ears fewer than usual. Rowen and fall feed have suffered from drought, except on moist land. There has been very little fall seeding done on account of dry weather. Onions are about a fair average crop, with little blight. Potatoes are about a two-thirds crop, very few in the hill, but of good size and fair quality. Root crops, celery and late market-garden crops are looking well at present, but need rain to mature. Apples are nearly a total failure; other fruits good. Late cabbages are not more than half a normal crop, but we have some unusually fine fields of Hubbard squashes.

*East Longmeadow* (JOHN L. DAVIS). — Indian corn is a full average crop and perhaps 10 per cent above. Fall feed is very poor, and there is very little rowen. Not much fall seeding has been done. Onions are a good crop in most cases. Potatoes are about a three-fourths normal crop, but are of poor quality. There is not a good yield of root crops, celery and other late market-garden crops in prospect. Apples dropped badly; peaches average; grapes very plenty; no cranberries raised.

*Chicopee* (E. L. SHAW). — Indian corn is a little above a normal crop. Rowen is a good crop, but fall feed is growing short. Less than the usual amount of fall seeding has been done, as the weather has been too dry. Onions are not raised here. Potatoes are a light yield,

of only fair quality. The prospect is fair for root crops, celery and other late market-garden crops. Apples few; pears a fair crop; peaches a good crop; grapes plenty.

*Wilbraham* (H. M. BLISS). — Indian corn is 85 per cent of a normal crop. Rowen and fall feed are in very poor condition, owing to the severe drought. Very little fall seeding has been done, and is in poor condition. Onions are a three-fourths crop. Potatoes are half a crop, of fair quality. The prospect for root crops, celery and other late market-garden crops is not as good as last year. Apples are half a crop; pears 75 per cent; peaches 85 per cent; grapes 95 per cent; and cranberries 75 per cent. The drought is the most severe since 1881, 1882 and 1883, when the streams were lower than at the present time.

*Hampden* (JOHN N. ISHAM). — Corn is about the only crop that is a full average yield this season. Both rowen and fall feed are fair, but below average. The usual amount of fall seeding has been done, but is starting very slowly on account of dry weather. The onion crop is variable; some fields good, others only fair. Potatoes are a light crop, but of good quality. The prospect for late market-garden crops is very good, but they are growing very slowly. Apples are less than half a crop; pears, peaches and grapes have all borne well. Potatoes had a good growth of vines, but are disappointing in the yield; quality good, but many are eaten by grubs and wire worms.

*Holland* (FRANCIS WIGHT). — Indian corn is fully up to the normal. Rowen and fall feed are not up to the average. There has not been much fall seeding done about here. The onion crop is hardly up to the normal. Potatoes are a very light yield, but of fair quality. Apples, pears, grapes and cranberries have turned out well.

## WORCESTER COUNTY.

*Warren* (W. E. PATRICK). — Indian corn is a normal crop this year. Dry weather has affected both rowen and fall feed; rowen about two-thirds of an average crop. The season has been too dry for fall seeding, and it is at present in very poor condition. Potatoes are about half a crop, of good quality. Apples are of very poor quality and a light crop; splendid crop of peaches, grapes and pears.

*North Brookfield* (JOHN H. LANE). — Indian corn is a good average crop. The rowen crop and fall feed are 25 per cent of the normal, owing to dry weather. Fully as much fall seeding has been done as usual, but it is now dormant, waiting for rain. Potatoes are a three-fourths crop, of good quality. Apples are 15 per cent of a full yield; pears 25 per cent; peaches 100 per cent; grapes 50 per cent; and cranberries 10 per cent. Grapes are drying up on the vines.

*Oakham* (JESSE ALLEN). — The corn crop is a full average. Rowen and fall feed are very light. The usual amount of fall seeding has been

done and is greatly in need of rain. Onions are not raised here. Potatoes are about half a crop. Root crops, celery and other late market-garden crops are little raised. There will be a small crop of all kinds of fruit. Rain is greatly needed.

*Dana* (LYMAN RANDALL). — Indian corn is fully up to the normal. Rowen and fall feed are below the usual average, there not being more than half a crop of rowen. There has not been much fall seeding done, on account of the continued dry weather. Onions are fairly good, though perhaps not an average crop. Potatoes are poor, both in yield and quality, not over 50 per cent of a crop. Root crops and late market-garden crops are fair. Apples are a light crop; pears, peaches and grapes good; cranberries a small crop.

*Petersham* (B. W. SPOONER). — Corn is a little short of a normal crop, but is of better quality than usual. A good crop of rowen has been harvested. No fall seeding has been done, as the ground has been too dry. Onions are raised only for family use. Potatoes are not over one-third of a normal crop, but are of good quality. The season has been too dry for late market-garden crops. What few apples there are are of good quality; pears a normal crop; grapes plenty. If this drought continues there will be a shortage of milk.

*Templeton* (LUCIEN GOVE). — Indian corn is better than an average crop; a few fields injured by frost August 29. Rowen was not an average crop, and the drought has cut fall feed short. Less than the usual amount of fall seeding has been done and it is in poor condition. Onions are not raised here. The yield of potatoes is below the average, but they are of good size and quality. The prospect for root crops, celery and other late market-garden crops is fair, though they have suffered from drought. Apples are a very light crop; pears good; peaches not raised; grapes good; cranberries not raised. We had copious rains in August, since then the drought has been very severe.

*Royalston* (C. A. STIMSON). — Indian corn is about 10 per cent below the normal. Rowen was not over one-fourth of an average crop. The severe drought has prevented any fall seeding being done. Potatoes are a two-thirds crop, of fair quality. The prospect is fair for root crops, celery and other late market-garden crops. There will be half a crop of apples; pears and grapes full crops; no peaches.

*Gardner* (W. E. KNIGHT). — The corn crop is above the average. Rowen started well, but the dry weather spoiled it, and also fall feed. Very little fall seeding has been done, owing to the dry weather. Onions are not raised hereabouts. Potatoes are half a crop, of good quality. Root crops, celery and other late market-garden crops are not raised here. Apples are 60 per cent of a full crop.

*Ashburnham* (E. D. GIBSON). — Indian corn is fully up to the normal. Rowen and fall feed are not up to the usual average, owing to dry weather. Little fall seeding has been done and none has germinated. Onions are not grown here. Potatoes are much below the normal in



both yield and quality. Root crops, celery and other late market-garden crops will all be much shortened, owing to the drought. There will be few winter apples; pears are a fair crop; also peaches and grapes; cranberries few.

*Fitchburg* (Dr. JABEZ FISHER). — Rowen and fall feed are not more than two-thirds of the normal. Potatoes are a very poor yield, but of fair quality. Root crops, celery and late market-garden crops are pretty small unless rain comes immediately. Apples are 75 per cent of a full crop and unusually fair; pears a two-thirds crop, but small and inferior; grapes a full crop and unusually fine. There has been but .03 of an inch of rain in more than four weeks. Apples and other fruits are ripening prematurely.

*Bolton* (H. F. HAYNES). — Indian corn is a full average crop. Rowen and fall feed have been very good, but the dry weather is hurting fall feed now. The usual amount of fall seeding has been done, but it is too dry for it to do well. Potatoes have gained since last report and are about half a crop. The prospect is poor for root crops, celery and other late market-garden crops. The prospect is poor for all kinds of fruit.

*Shrewsbury* (FRED J. REED). — There will be a very good crop of corn. Rowen was a very fair crop, but fall feed is drying up badly. The drought has been so severe that very little fall seeding has been done, and it has not started yet. Onions are a fair crop. Potatoes are light in yield, but of fair quality. Root crops, celery and late market-garden crops are fairly good, considering the dry weather. Apples are a light crop, and other fruits are not very good yields.

*Leicester* (H. H. KINGSBURY). — The fodder on the corn crop is abundant, but the grain has not filled out. Rowen was up to the usual average, but pasturage is now scant. More than the usual amount of fall seeding has been done, and is now doing well. Onions are not raised. The crop of potatoes is below the normal in yield, but is of good quality. Late crops which do not need rain are doing well. The apple crop is about 60 per cent of an average; pears are a normal crop; no peaches nor cranberries; grapes abundant.

*Auburn* (WM. GILBERT). — Corn is a big crop, above normal, although the frost hurt it on low ground in August. The rowen crop is good and fall feed is above normal. There has been the usual amount of fall seeding done and it is looking finely. The onion crop is below the average. Potatoes are a small crop, owing to blight and rot. Celery and other root crops are below normal. Apples are a light crop and grapes a heavy crop.

*Blackstone* (O. F. FULLER). — All report a good crop of Indian corn. Rowen and fall feed are up to the usual average. Farmers are just at present putting in fall seeding. Very few onions are raised here. The yield of potatoes is not quite as large as usual, and they are rotting somewhat. The prospect for late root crops is good. There will not



be a large crop of apples, not as large as was expected; peaches quite a good crop; cranberry worms damaged the crop a good deal; grapes, both wild and cultivated, a good crop.

## MIDDLESEX COUNTY.

*Hopkinton* (W. V. THOMPSON). — Indian corn is better than an average crop. Rowen and fall feed are not up to the usual average. Less than the usual amount of fall seeding has been done. Potatoes are a very small yield, but are of good quality. The prospect is poor for root crops, celery and other late market-garden crops. Apples are a small yield; peaches few; grapes a large yield; cranberries injured by frost.

*Marlborough* (E. D. HOWE). — Indian corn is 95 per cent of a normal crop. Rowen and fall feed are up to the usual average. Less than the usual amount of fall seeding has been done, owing to dry weather. Onions are 90 per cent of a full crop. Potatoes are not over one-fourth of a normal crop in yield, but are of good quality. Root crops, celery and other late market-garden crops are not much raised. Apples are half a crop; pears 60 per cent; peaches 75 per cent; grapes a full crop.

*Stow* (GEO. W. BRADLEY). — Corn is about an average crop. Rowen started well, but is feeling the drought. No fall seeding has been done as yet. Onions are about half a crop. Potatoes are of fair quality, with about half a normal yield. Apples are a fair crop; pears good; peaches scarce; grapes plenty; cranberries scarce.

*Maynard* (L. H. MAYNARD). — Indian corn is above the average in yield and quality. Rowen and fall feed are good on low lands, but are in need of rain. Some fall seeding has been done, but owing to dry weather is uneven in growth. Onions are normal in yield, but smaller in size than usual. Potatoes are of good quality, but the yield is unusually short. Celery and root crops are good on low lands and will be average crops. Apples, pears, peaches, grapes and cranberries have all been average crops; many apple trees give fruit of poor quality, while on others it is unusually smooth and fair.

*Westford* (J. W. FLETCHER). — The corn crop is a very good one. Rowen and fall feed are below the usual average, as the weather has been too dry for them. About the usual amount of fall seeding has been done, but the drought has prevented much progress. Potatoes are half a crop. Apples are a fair crop.

*Tewksbury* (G. E. CROSBY). — Indian corn is not raised here. Rowen and fall feed are below the usual average, owing to drought. Not as much fall seeding as usual has been done, and that on dry land makes a poor showing. Onions are little grown, but are a fair crop. Potatoes are perhaps one-third of an average crop in yield and the quality is little better. Celery is looking very well. Grapes seem abundant; other fruits light.

*Concord* (WM. H. HUNT). — Indian corn is below the average. Rowen and fall feed have suffered from dry weather. There is about the usual amount of fall seeding put in, but it has not germinated as well as usual. Few onions are raised and they are below the average in yield. The potato crop is about half of a normal crop in yield, but is of good quality. Root crops, celery and other late market-garden crops show the effects of the extreme drought. Early apples are abundant, winter apples about half a crop; pears are a fair crop; other fruits medium.

*Lincoln* (C. S. WHEELER). — What Indian corn is raised here looks well and is fully an average crop. Rowen is not over half a crop and fall feed is light. About the usual amount of fall seeding has been done, and is 20 per cent off in condition. Not many onions have been raised here. Potatoes are average in yield, but of excellent quality. The prospect is fair for root crops, celery and other late market-garden crops. Apples are half a crop; pears average; peaches half a crop; grapes below average; very few cranberries.

*Stoneham* (J. E. WILEY). — Corn is not much raised. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done and is looking well. Potatoes are a poor crop, both in yield and quality. The prospect is good for root crops, celery and other late market-garden crops, if we have rain. Pears are a good crop and apples are a fine crop.

*Winchester* (S. S. SYMMES). — Indian corn is not raised here. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding was done, but it has dried up in spots. Onions are very small in size and there is about half a crop. Potatoes are also of very small size and not over half a normal crop. The prospect is very poor for all late crops. Apples are ripening early; pears nearly all picked; peaches all gone; all other fruits of small size. Cauliflower and late cabbage are at a standstill and celery in many places is very small. All crops have been covered with dust for weeks, and the growth has been very slow.

*Weston* (HENRY L. BROWN). — There is a small crop of rowen and feed is getting short. Early seeding came up well and is looking fairly well, but the weather has been too dry for seeding in September. Onions are not raised in this locality. Potatoes are of good quality and about one-fourth a crop. Root crops, celery and other late market-garden crops are much in need of rain. Apples are small; pears are a fair crop, but are dropping badly; peaches and grapes not grown to any extent; cranberries not grown at all. Cabbages and turnips are almost at a standstill.

*Newton* (G. L. MARCY). — Rowen and fall feed are not up to the usual average, except on low land. The drought has been too severe to allow of fall seeding. Onions are not grown to any extent. The

potato crop is a poor one. The prospect is poor for root crops, celery and other late market-garden crops. Apples, pears, peaches, grapes and cranberries are below the average.

#### ESSEX COUNTY.

*Salisbury* (WESLEY PETTENGILL). — Indian corn is a good normal crop, rather better than the average. On good land, where the first crop was cut early, rowen was unusually good. There has been considerable fall seeding done, but it looks poorly, owing to dry weather. The quality of the potato crops is good, but the yield is light. The prospect for late crops is rather poor, on account of the drought. Apples are a light crop; pears good; peaches fair; grapes good; cranberries rather light. Squashes are an uncommonly good crop this year, but the late cabbage crop bids fair to be light.

*Amesbury* (F. W. SARGENT). — The corn crop is better than a normal one; is an extraordinary crop. Rowen was not up to the usual average and fall feed is exceedingly short, except on moist land. Much more fall seeding would have been done with timely rains, and there is much land prepared but not seeded. Onions are three-fourths of a normal crop, of good quality. Early potatoes were half a crop and late varieties give a three-fourths yield. The prospect is fair for root crops, celery and other late market-garden crops, owing to drought. Apples are one-third of an average crop, of good quality, but are dropping because of drought. Harvesting is being done earlier than usual, the hot dry weather having matured all crops, and the work progressing without interruption.

*Rowley* (D. H. O'BRIEN). — Indian corn is better than an average crop. Rowen and fall feed are hardly up to the usual average. The usual amount of fall seeding has been done, but the dry weather has prevented germination. Very few onions are grown in this section, but there is a fair crop so far as they are grown. Potatoes are 50 per cent of a normal crop and the quality is below the average. The prospect is rather poor for root crops, celery and other late market-garden crops. Apples are a medium crop; pears fair; peaches and grapes extra good; cranberries spoiled by the early frost. We have remarkably heavy yields of squashes and tomatoes.

*Topsfield* (B. P. PIKE). — Corn is 80 per cent of a normal crop. There is very little rowen and fall feed is very short. More than the usual amount of fall seeding has been done, but the seed has not germinated as yet. Onions are little raised. Potatoes are of good quality, but not more than half a crop in yield. Squashes are a heavy crop; other late market-garden crops fair. Apples are very uneven, some having a fair crop and others very few; pears half a crop; peaches half a crop; grapes a full crop; cranberries badly damaged by frost.



## NORFOLK COUNTY.

*Cohasset* (ELLERY C. BATES). — Indian corn is about a normal crop. Rowen and fall feed are up to the normal. The usual amount of fall seeding has been done and is in fair condition. Onions are a small crop. Potatoes are about half a crop. The prospect is good for root crops, celery and other late market-garden crops. The fruit crop is about normal.

*Randolph* (RUFUS A. THAYER). — There is a good yield of corn, both for grain and ensilage. The rowen crop was good, but fall feed is short. Fall seeding is not in good condition, owing to drought, and not as much as usual has been done. Onions are a very good crop. Potatoes are of good quality, but are not up to the average in yield. Turnips and celery are good crops. Apples are a fair crop, but have ripened earlier than usual, on account of drought; pears and grapes are good crops; cranberries are small and a short crop. Wells and springs are very low.

*Canton* (EDWIN V. KINSLEY). — Indian corn is more than an average crop. Rowen was a full average crop, but fall feed is very light. The usual amount of fall seeding has been done, but has made no growth, because of drought. Onions are a light crop, below average. Potatoes are of good quality and about half a crop in yield. The prospect is bad for root crops, celery and other late crops, but plentiful and immediate rains will save the situation. Apples, pears and peaches are light crops; grapes and cranberries better than was expected. There is general seeding of white pine, nearly all trees bearing cones.

*Stoughton* (CHAS. F. CURTIS). — Corn is fully up to the average for grain; silo corn is a full crop on low land, but only a three-fourths yield on uplands. The usual amount of fall seeding has been done, but is waiting for rain. There are no onions raised here. Potatoes are a normal crop. Apples are one-sixth of a crop; pears one-eighth; peaches one-tenth; grapes are a very full crop, both wild and cultivated; cranberries half a crop.

*Norfolk* (A. D. TOWNE). — Indian corn is more than an average crop. Rowen was about a normal crop and feed in pastures is short. About two-thirds the usual amount of fall seeding has been done, and it is in poor condition, owing to dry weather. Potatoes are of good quality, with perhaps a three-fourths crop. Pears, peaches and grapes are good crops; cranberries light; apples have dropped badly, and are smaller and poorer in quality than usual for the bearing year, about 80 per cent of an average crop.

*Millis* (E. F. RICHARDSON). — The corn crop is much better than the average, in fact the best I have ever known. Rowen and fall feed are not quite up to the usual average. The usual amount of fall seeding has been done and is looking well, but needs rain right away. Onions are a good crop. Potatoes are less than an average yield, but are of



good quality. The prospect for root crops, celery and late market-garden crops is very fair. There are very fair yields of apples, pears, peaches, grapes and cranberries.

### BRISTOL COUNTY.

*Mansfield* (WM. C. WINTER). — Indian corn is a normal crop. Rowen and fall feed are about up to the usual average. About the usual amount of fall seeding has been done, and is in fair condition, but needs rain. Onions are little grown. A light crop of potatoes is expected; some rot, but quality generally good. Root crops, celery and late market-garden crops are little grown, but look well. Winter apples are a very light crop; pears heavy; peaches light, also cranberries; grapes good.

*Attleborough* (ISAAC ALGER). — The corn crop is above the average. Rowen is not much grown, and fall feed is in average condition. The usual amount of fall seeding has been done. Potatoes are not an average crop. The prospect is fair for root crops, celery and other late market-garden crops. There will be a small crop of fruit.

*Seekonk* (JOHN W. PECK). — Corn is little raised except for the silo, and is good for that purpose. Drought has prevented growth of rowen and fall feed on all high lands; very low lands fairly good. Early fall seeding looks well, later is up only on moist lands. The drought checked the growth of onions and they are not above the normal. There is three-fourths of a crop of potatoes, of good quality. Drought has checked growth of root crops and all late crops. Pears plenty; apples and peaches scarce; grapes fair. Wells and springs are very low.

*Dighton* (HOWARD C. BRIGGS). — Indian corn is more than an average crop. Rowen and fall feed are not up to the usual average. Not as much fall seeding as usual has been done, and it is in poor condition. Very few onions are raised, and they are a light crop. Potatoes are about half a crop, of good quality. Root crops, celery and other late market-garden crops are not up to the average. Apples are a light yield; cranberries half a crop; grapes a full crop; peaches and pears average. No rain for nearly a month; vegetation suffers and streams are low.

*Swansea* (F. G. ARNOLD). — Corn is more than an average crop. But little rowen has been secured; fall feed is up to the average. About the usual amount of fall seeding has been done, but it is not very forward, owing to dry weather. There is about an average yield of onions. Early varieties of potatoes gave a light yield; later varieties a fair yield. Celery, turnips and carrots are backward and need rain. Apples are a poor crop; pears, peaches and grapes plenty; cranberries not grown.

*Acushnet* (M. S. DOUGLAS). — Indian corn is about a normal crop, with more planted than usual. Rowen and fall feed are not up to the usual average. Less than the usual amount of fall seeding has been

done, and it is not growing well, on account of drought. Onions are small in size and less than a normal crop. Potatoes are from one-half to two-thirds of a crop and are of good quality. With rain there will be large crops of roots, celery and late market-garden crops. There are very few apples and peaches; pears and grapes good; cranberries a fair crop. The season has not been a profitable one for our farmers, because of partial failure of market-garden crops.

## PLYMOUTH COUNTY.

*Brockton* (DAVIS COPELAND). — The corn crop is very good. Rowen and fall feed are up to the usual average on good land. The usual amount of fall seeding has been done and looks well on moist land, but has dried up badly and been badly injured by grasshoppers on high land. Root crops, celery and late market-garden crops promise good yields. Apples are a poor crop and pears a good crop. The heavy fogs we have almost every night are helping to keep things green and growing.

*Marshfield* (J. H. BOURNE). — Indian corn is a large crop in quantity and fully normal in quality. Rowen is a light crop, except on low, rich ground. The usual amount of fall seeding has been done, and much has just been put in. Onions are little raised here. The yield of potatoes is decidedly less than usual and the quality poor. Root crops, celery and late market-garden crops all need rain. Cranberries are a three-fourths crop, but ripened well, and are mostly gathered; apples a full crop; also grapes; pears and peaches fairly good.

*Hanson* (FLAVEL S. THOMAS, M.D.). — Indian corn is more than a normal crop. Rowen and fall feed are above the usual average. About the usual amount of fall seeding has been done, and is in good condition on low land, and in poor on high land, because of drought. Potatoes are a small crop, of good quality, and show no rot. The prospect is fair for root crops, celery and other late market-garden crops. All fruits are good yields except cranberries, drought and worms having cut them short.

*Kingston* (GEORGE L. CHURCHILL). — The corn crop is a very fair yield. Rowen and fall feed are up to the usual average. Not much fall seeding has been done as yet. Onions are a fair crop. Potatoes are a light crop, of fair quality. The prospect for root crops, celery and other late market-garden crops is very fair. Apples are looking fairly well; peaches, pears, grapes and cranberries are fair crops.

*Bridgewater* (R. CASS). — Indian corn is a good average crop. The rowen crop is below the normal, and fall feed above. Very little fall seeding has been done at this time. Potatoes are not more than half a crop and are of poor quality. The prospect for late garden crops is good. Pears and grapes are good crops; other fruits poor.

*Lakeville* (NATHANIEL G. STAPLES). — The corn crop is a little above the normal. Rowen and fall feed are about up to the usual average.

About the usual amount of fall seeding has been done and it is at present in good condition. Onions are not quite an average crop. The yield of potatoes is small, but the quality is good. The prospect is good for root crops, celery and other late market-garden crops. Apples are not average crop; peaches fair; pears good; grapes good; cranberries below average.

*Wareham* (A. B. SAVARY). — Indian corn is about a normal crop. Rowen and fall feed are below the usual average, owing to dry weather. Very little fall seeding has been done, as it is too dry. Onions are not raised here. Potatoes are below the normal in both yield and quality. The prospect is poor for root crops, celery and other late market-garden crops, owing to dry weather. Apples and cranberries are a light crop; other fruits about normal.

### BARNSTABLE COUNTY.

*Bourne* (DAVID D. NYE). — The crop of Indian corn compares favorably with the normal. Rowen and fall feed are up to the average, and in many places exceed last year. A small amount of fall seeding has been done and is at present in very satisfactory condition. Onions are very small and not much raised. Potatoes compare well with the normal in both yield and quality. Market-garden crops are little raised. Apples, peaches and cranberries are all below normal crops.

*Mashpee* (W. F. HAMMOND). — Indian corn is above the average. Rowen and fall feed are above the average. Onions are less than an average crop. The potato crop is almost a failure. Late root crops will give about normal yields. Apples, pears and grapes are two-thirds crops; cranberries half a crop.

*Barnstable* (JOHN BURSLEY). — Corn is an average crop. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done; that sown early looks well, but late sown is suffering for rain. Onions are not grown. Potatoes are 65 per cent of the normal in yield and of good quality. Cape turnips must be very small unless rain comes soon. Apples are a light crop; pears, peaches and grapes full crops; cranberries not over 70 per cent in quantity, but of good quality.

*Brewster* (THOS. D. SEARS). — Indian corn compares favorably with a normal crop. There is a very good crop of rowen and fall feed is in good condition. The usual amount of fall seeding has been done, but owing to dry weather the present condition is rather poor. Onions compare well with a normal crop. The potato crop is far below normal in yield and quality. The prospect is favorable for root crops. There has been a fair crop of apples, pears, peaches, grapes and cranberries.

*Eastham* (J. A. CLARK). — More corn has been planted than usual and it has done well. Pastures have been good since the rains in August. Onions are little raised. The potato crop is about two-



thirds of the normal in yield and of good quality. Root crops, celery and other late market-garden crops are badly in need of rain. Fall apples are plenty, but winter apples are scarce; cranberries a fair crop. More turnips were planted than last season. Asparagus on old fields rusted badly.

*Wellfleet* (E. S. JACOBS). — Indian corn is about an average crop. The rowen crop is above the average. There has been no fall seeding done as yet. Very few onions have been planted in this vicinity. Potatoes are a very good yield and of good quality. The prospect for root crops, celery and late market-garden crops is rather poor, dry weather having checked them. Apples, pears, peaches, and especially cranberries, have been far above the average.

#### DUKES COUNTY.

*West Tisbury* (GEO. HUNT LUCE). — Indian corn is below the average. The rowen crop is nearly a failure, and fall feed is below the average. It has been too dry to do fall seeding. Potatoes are a poor yield, but are of good quality. The prospect is poor for root crops, celery and other late market-garden crops, owing to dry weather. Apples and pears are average crop; grapes above the average; cranberries below average.

#### NANTUCKET COUNTY.

*Nantucket* (H. G. WORTH). — The corn crop will be very near the normal. Rowen and fall feed are in good condition. Very little fall seeding has been done. There is a normal yield of onions. Potatoes are not over 60 per cent in either yield or quality. Root crops are looking well. No fruit raised; cranberries are a good crop.



## BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

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### RENOVATING OLD ORCHARDS.

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By Prof. F. C. SEARS, *Professor of Pomology, Massachusetts Agricultural College.*

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There are undoubtedly thousands of old apple trees in Massachusetts, some in orchards and others scattered about fields, which would pay good returns if they could be thoroughly "renovated" and thereafter be given proper treatment. On the other hand, there are just as many, and probably far more, which would be more profitable on the woodpile than anywhere else. The first question, then, for one to decide, if he owns such trees or orchards, is "Will it pay to make the attempt to get them into a thrifty condition again?" In the writer's opinion this depends on four questions: 1, the age and vigor of the trees; 2, the stand of trees in the orchard; 3, the varieties; and 4, whether the San José scale is in the orchard or the immediate vicinity of it. To discuss each of these briefly:—

1. *The Age and Vigor of the Trees.*—If the trees are vigorous, with good trunks and main branches, unaffected with canker or other injuries to the bark, it has been my experience that they can be brought into a profitable condition even though the tops are full of dead branches and they have been systematically neglected for years. This, of course, is supposing that the other factors mentioned above are favorable. It is truly surprising what can be done with an old orchard when it is taken in hand and given modern, up-to-date treatment. On the other hand, if the trunks or main branches are damaged with canker, or have been injured with cold so that the bark has fallen away in patches of any size, as very often happens, then it is very doubtful if the orchard would pay for renovating. It must be remembered that the trunk is the highway by which the results of our improved care are transported back and forth from the roots to the top, and if this highway is in a demoralized condition we are not going to get the best results.

2. *The Stand of Trees.*—This, of course, is supposing that the trees to be treated are in an orchard, and it will be easily seen that if half

of the trees are out it is not going to pay to cultivate and fertilize the whole of the land for trees which could be put on half of it. And it is never satisfactory to attempt to grow anything else in such vacant spaces in an old orchard, nor to plant young trees in the vacancies. If the trees are along fences or odd corners, so that cultivation of the soil will not be attempted, then the question of stand is less important, and may, perhaps, be ignored altogether. But in an orchard there ought to be a three-quarters stand at least to make it worth while to take the matter up, except under the most favorable circumstances.

3. *The Varieties in the Orchard.* — This is of less importance than the two points already mentioned, yet it is a factor that is decidedly worth considering and that has an important bearing on the cost of the renovating process. It is, of course, possible to graft over the trees, but this is both an expensive and a lengthy operation, and I should condemn an orchard to the brush heap which needed to be grafted far more quickly than one which already had the right varieties in it. Of course the question of varieties is very largely a personal one, and need not be discussed here, but I should mean by "right" such varieties as suited the grower and the markets for which he was producing, preferably standard sorts, like Baldwin, Rhode Island Greening and Roxbury Russet.

4. *The San José Scale.* — I should certainly feel much less like attempting to recover an old orchard which was infested with the scale, or even which was near an infested orchard, than one which was free from it and in a locality where it did not exist. I do not mean by this that I should despair of recovering an orchard where the scale was fairly plentiful, for I have known of a number of cases where such orchards have been made thrifty and profitable. But it certainly does add a very serious element to the situation, and it is going to require both time and money to eradicate it.

The above, as I have said, are the main factors in deciding for or against the renovation of an old orchard, yet perhaps I have omitted the chief factor after all, and that is the man himself. If he has just come into possession of the orchard, and is making an attempt to clean up all along the line, I should have far more faith in the ultimate good results of the matter than if he were author and finisher of the neglect from which the orchard has suffered, even though he might have firmly determined to "do the right thing by the orchard" from henceforth.

Having finally decided that the orchard is worth while, the work of renovating will fall naturally under the following heads: 1, cultivation; 2, pruning; 3, spraying; 4, fertilizing; 5, cover-crops; 6, grafting, — arranged somewhat in the order of their importance, though of course this will vary greatly with different orchards, and though all will be needed to secure the best results.

I have placed cultivation first because, though trees will often do well in sod, if otherwise well cared for, and though it may sometimes



be necessary, even in attempting to revive an old orchard, to let the trees stand in sod, yet, as a rule, to get them into satisfactory condition cultivation is the prime requisite, and will do more than any other one thing to start the orchard on the right road. It is usually difficult



FIG. 1.—Type of tree which should be cut back severely in renovating, 10 or 12 feet at least could be removed to advantage. Except for poor trunk (see Fig. 2) this tree could be very successfully remodelled.

in an old orchard, such as we are considering, to do anything like a thorough job of ploughing. If one can secure an ox team they will do the work better than a team of horses, as they will be able to get

under the trees better, and the slow, steady gait of the oxen is better than that of most horses. Do not be alarmed over cutting some tree roots with the plough, even some large roots. A little root pruning will not hurt the trees, and the fresh, new, feeding-roots, sent out from the broken and cut ends of the old roots, will very soon equal in absorbing ability the parts of the old roots which are cut away. Another point in ploughing is the question of throwing the furrow towards or away from the trees. One frequently finds an old orchard in which the ploughing has been for years always in the direction of the trees, until each row stands along a ridge, with deep hollows between. Such an orchard should be ploughed away from the trees, until the land gets back reasonably level again. After that it is well to plough the orchard alternately towards and away from the trees, — one year north and south and the next east and west. In this way the land can be kept in the best condition for the trees.

Occasionally it is impossible to do even a makeshift job of ploughing, and then one can sometimes begin operations by running a heavy disc harrow through the orchard, to cut up the sod and start things in the right direction, and perhaps plough it the following year.

After the ploughing has been done it is always advisable to use the disc harrow and follow it with the spring-tooth harrow, going both ways with each one of them, and going over the land several times, so as to get the land in good tilth. After this, through the balance of the season, it is best to cultivate the land once every week or ten days, up to perhaps the middle of July. And let this weekly cultivation be thorough! If the two harrows suggested, disc and spring-tooth, are available, it is well to run the disc over first, the long way of the orchard, and then finish with the spring-tooth, the opposite way. This insures all the land being worked over, and leaves it more level than if one finishes with the disc, which of course is desirable on account of reducing evaporation. It is difficult to overdo cultivation at this season of the year, and with an old, neglected orchard I should feel inclined to let this be the principal feature of the programme, so far as the soil is concerned.

Now for our second point in the programme, pruning. This is apt to vary more in the extent to which it is needed and in the character of it which is best to apply than any one of the other factors. If the trees are very high, with little or no bearing wood near the center, as is very apt to be the case, then they should be given very drastic pruning, so as to grow an entirely new top, a good many feet nearer the ground than the old one. It will practically amount to the removal of all the top in perhaps two years, and the branches should be cut down at least six or eight feet, and sometimes much more. This seems like heroic treatment and it is, but in the great majority of cases, if the trees are otherwise healthy, they will send out a bushy top, which, with judicious thinning, will make practically a new tree out of the



old one. And one great reason why such old trees as we are now considering (tall, overgrown ones) are *not* profitable is that they are so tall that every operation — pruning, spraying, picking, etc. — is

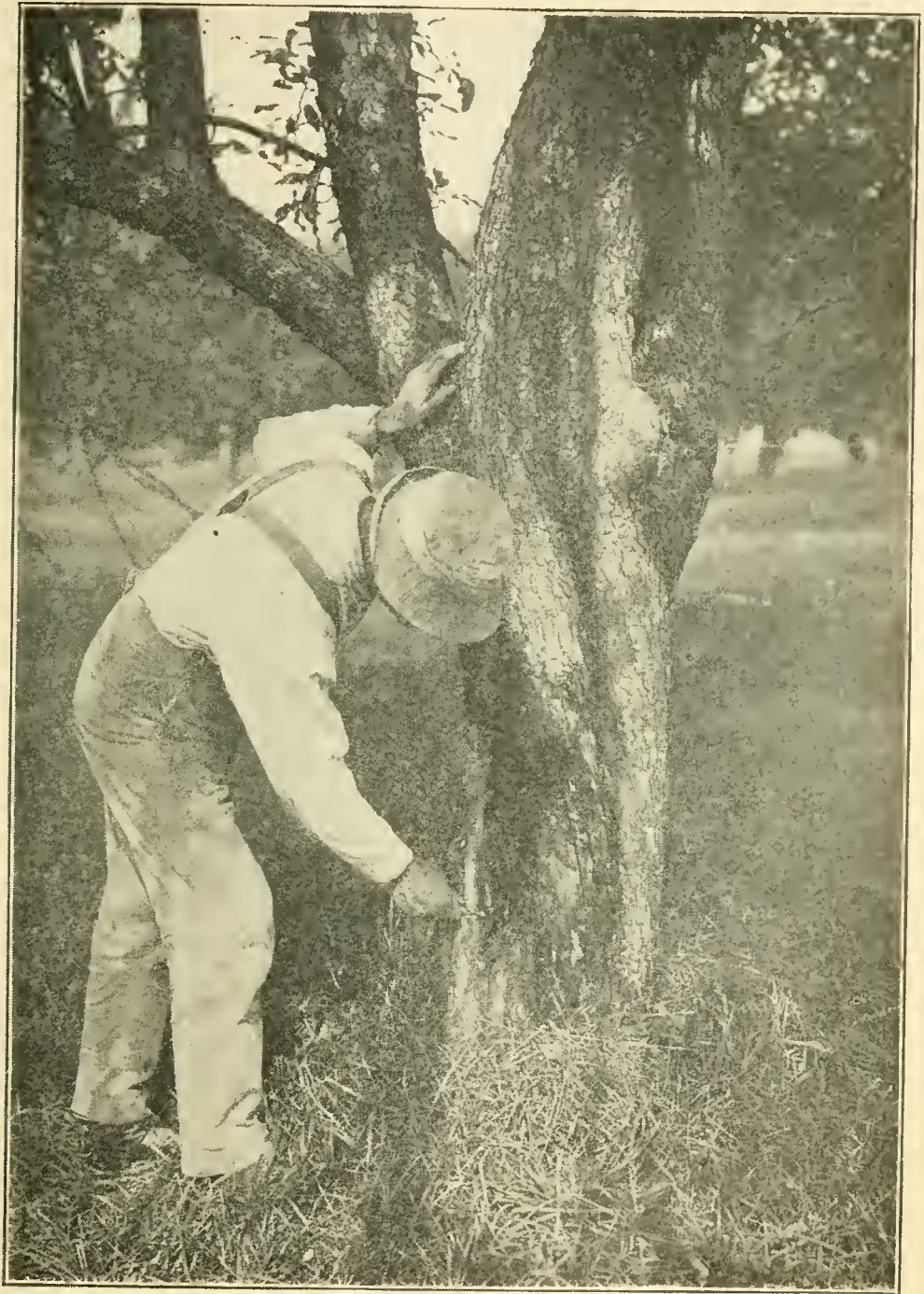


FIG. 2. — Trunk injured by cold. Such trees are not worth renovating.

four or five times as costly as with lower trees. So it is absolutely essential to get them down nearer the ground if they are ever to be made profitable. On the other hand, if the trees are reasonably low the pruning may consist largely in thinning the top throughout, beginning, of course, with the dead branches, and then taking enough live

ones to leave the head fairly open to light and air, and to the sprayer when that comes on the scene. Even in this class of trees (those which are *not* unreasonably tall), it is often possible to reduce their height to advantage, without materially altering their form, by simply cutting back each of the main, upright branches to one of its strong, main offshoots. The effect may not be just what we would like at the start, and the top may be somewhat thrown out of balance, but with a year's growth it will largely recover its symmetry, and even if it should not altogether the advantages of the lower top will offset any disadvantages.

Another point in this pruning, and one often neglected, is not to remove too large branches in the thinning. Of course it is much easier to remove what one considers the required amount of wood by taking out a few large branches, but the results are much better if one will take comparatively small branches (not above an inch and a half in diameter) and take more of them. This thins the top uniformly, letting in light, air and spraying materials to all parts equally; while the removal of a few large branches leaves the top too open in some places and as thick as ever in others. Still another point which one should bear in mind in his pruning is to keep a sharp watch for diseased branches, and take these out in preference to healthy ones. The European and blight cankers are, in particular, liable to be found in such an orchard, and may be largely held in check by such pruning. And lastly, after the pruning has been done, and the wounds made have had time to dry up and "check" somewhat, all wounds of an inch and a half or over should be thoroughly painted with thick lead paint, to keep out moisture and prevent decay. White lead and boiled linseed oil make the best kind of covering for such wounds, but it is well to add a little brown color, merely to take off the glaring whiteness of the painted wounds. One frequently sees the advice to take a paint pot into the tree when pruning, and attend to the painting at once, when the limb is removed, but in the writer's experience the pruning tools are all that one wants to be bothered with at one time, and the paint will certainly adhere better to the cut surface when this has dried somewhat.

Our thirdly is the spraying problem. This is going to vary somewhat, according to the insect and fungous diseases which may be present in the orchard or locality. If the San José scale is there a thorough spraying with the lime-sulphur wash, just before the buds swell in the spring, will be found to be the most efficacious treatment. Some of the other ways of fighting this pest come highly recommended, particularly the soluble oils, but in the writer's observation the best thing at present is the lime-sulphur, and one has the satisfaction of knowing that while he is driving this pest out of his plantation he is also most effectively reducing the vigor of a number of fungous diseases, which might have caused trouble later in the season. In this



connection (fighting insects and fungi) one is frequently asked as to the desirability of scraping the trees to remove the rough, scaly bark. While this ought not to be necessary as a regular practice in orchards

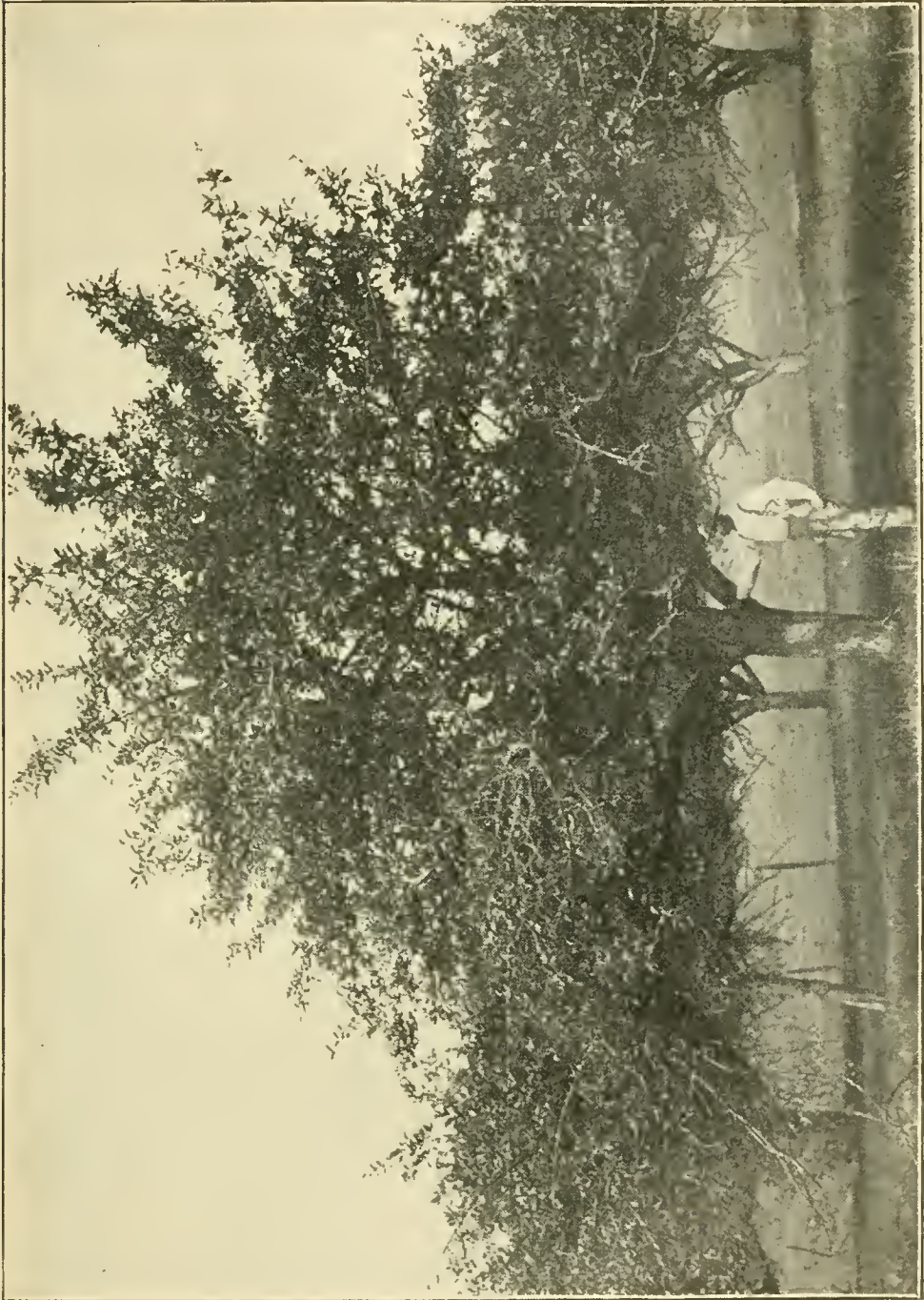


FIG. 3.—A promising type of tree for renovating. When dead branches have been removed and top thinned it will make an excellent tree.

which are cared for, and especially in those which are sprayed, yet in the beginning I believe it is an excellent treatment for such orchards as we are considering. Certainly it will add materially to the effectiveness of any washes which may be applied to the trunks of the trees.

Next to the lime-sulphur wash, Bordeaux mixture stands out pre-eminently as the spraying material. And if the San José scale is not

in the orchard it will probably be the only material necessary to use if we add to it, as of course we will, some arsenical poison, preferably arsenate of lead, for chewing insects. It is a little difficult to outline just what the season's campaign should be in spraying, without knowing what foes we have to combat, but in general the following will be found satisfactory. Begin before the buds swell, at least to any extent, and make a thorough application of Bordeaux mixture. Use the Bordeaux type of nozzle, which throws a coarse stream with more force than other types. Spray trunk and main branches, as well as the top, and with these parts particularly, trunk and large branches, do not be afraid to use plenty of material. This is contrary to the rules of good spraying when the trees are in leaf, but when they are bare the advantage of reaching thoroughly all the cracks and crevices in the bark will offset any disadvantages. Let this spraying be followed by another, just before the blossom buds open, when they are large enough to be separated from each other in the cluster and to show some pink or white, but before they have opened enough to show the stamens or pistils. For this spraying I should use the same materials, Bordeaux mixture and arsenate of lead, but I should use an entirely different nozzle, selecting one of the Vermorel or the Friend type, which, instead of throwing a coarse stream with some force, delivers the spray in fog-like mist, which will float about among the leaves and buds, and thus reach all parts of them. I should be much more careful about drenching the trees. Spray so as to wet them thoroughly with as little drip as possible, and again spray trunk and main branches as well as the other parts. If this spraying is followed by a third one within a week or ten days after the petals have fallen from the blossoms, using the same materials and the same nozzle, and the same precautions, as in the second spraying, I should have a great deal of confidence that the result would be a crop of clean fruit. Of course one may be confronted by special problems, like an acute attack of canker worms or a scourge of apple aphis, in which case a specialist should be consulted. But for all ordinary cases the foregoing programme ought to be entirely adequate, and it would certainly surprise most old orchards to receive half of this attention.

The fourth factor in our operations is the fertilizer question, which is naturally very closely related to our cultivation problems and sometimes has to be varied to suit the cultural methods adopted. At the beginning I do not believe it is desirable to apply any nitrogenous fertilizers, or if they are applied it should be in very limited quantities, and early in the season. A moment's reflection will show the philosophy of this. Trees which have been allowed to grow in sod, as the old orchards which we are considering will undoubtedly have been, and in soil which has been impoverished by constant removal of the grass as hay, and of the fruit, without any return of fertilizer, will have long, straggling roots sent out to forage at a distance for all the plant food



possible. And these long roots will have comparatively few branches or small feeding roots, as it is notorious that roots branch freely in a fertile soil and sparsely in a poor soil. Now when the land in

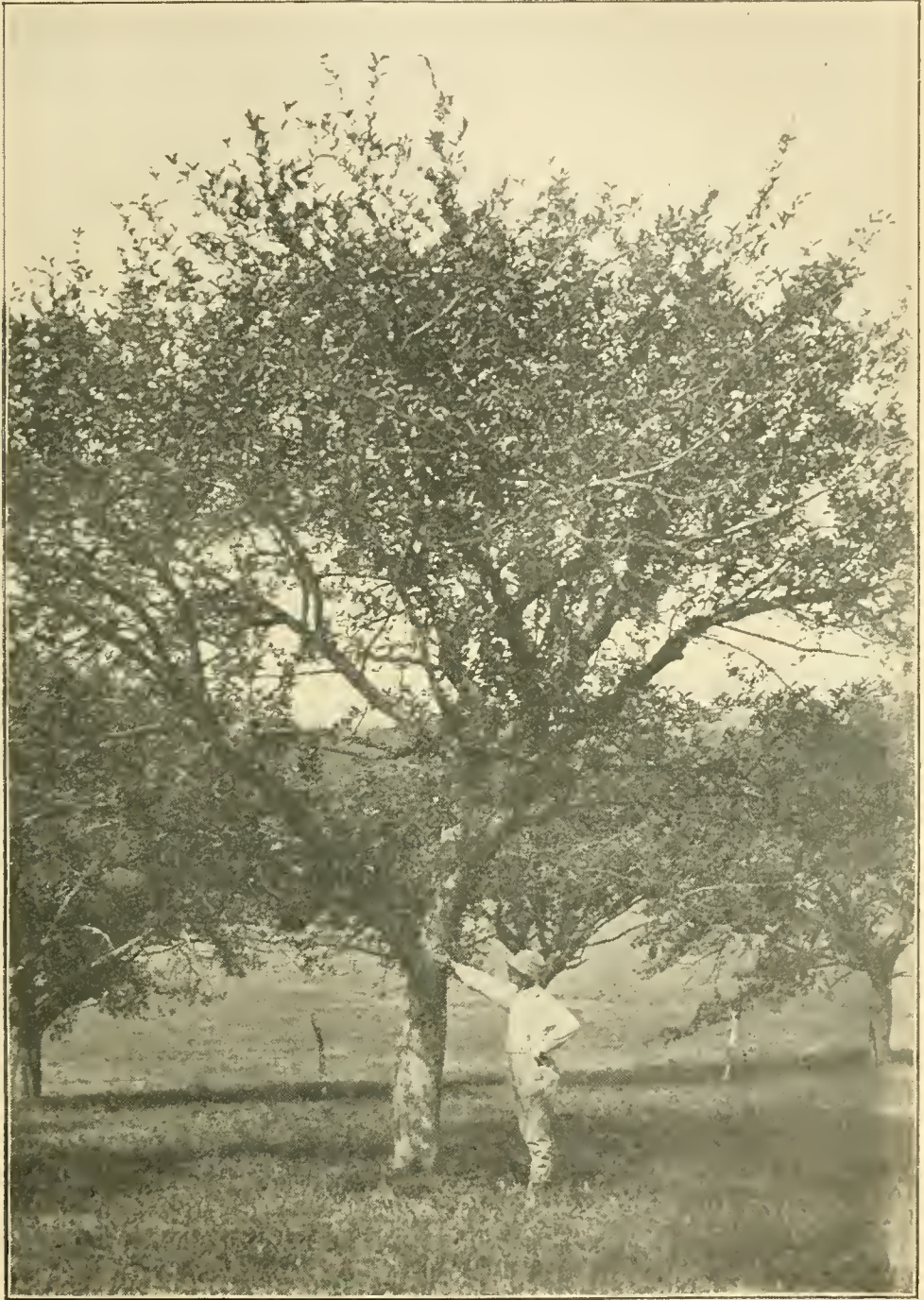


FIG. 4. — A poor type of tree for renovating. Trunk is too long and main branches have no bearing wood except at tops. If renovation is attempted this tree should be severely cut back to renew the top.

the orchard is ploughed and cultivated, and fertilizers are applied, the conditions become very much more favorable in the soil, and the roots begin to branch freely in response to these improved conditions. If the fertilizer has been applied in the form of barn manure, as is

often the case, this requires some time to decay and get into soluble condition so that the roots can take it up, but when this has taken place it furnishes a large amount of highly nitrogenous food which tends to stimulate a very strong wood growth late in the season. The trees having the root systems such as we have described, long and spreading, and having sent out an abundance of feeding roots all along these original main roots in response to improved conditions, are sure to take up an unusual amount of this plant food, much more than trees which have had regular care from the beginning, and which therefore have more compact root systems. The result is that the growth is continued very late in the season, that the new layer of tissue between the old bark and wood does not ripen up in the autumn as it should, and that when cold weather comes on it is no better fitted to withstand freezing than a potato or a cabbage, and is destroyed during the winter. Soon after this the bark separates from the wood, and the tree dies if the bark has been killed all round, or is seriously weakened if only part way. For these reasons, as I said in the beginning, I should advise withholding nitrogenous fertilizers almost entirely the first season. If the soil has any fertility to it at all the cultivation and consequent improved physical condition will liberate all the nitrogen that the trees need to make an entirely satisfactory growth.

But of course these arguments do not apply to other fertilizers, and I should use them freely. I should begin with a half ton per acre of lime. It has been my observation that very few old orchards indeed will not respond wonderfully to such an application. We need not discuss the usual methods of determining whether lime is needed, but I am satisfied that even when such tests as litmus paper, for example, fail to indicate a sourness in the soil, an application of a half ton of lime per acre will still be very beneficial to the trees. With apples particularly, but with all fruits more or less, an abundance of lime gives a shorter, stockier growth of wood, and fruit which, though perhaps a little smaller, is more firm, better keeping and more highly colored. This lime application need not be made every year, of course, but I should begin with it and should repeat it once in four or five years.

In addition to this I should give a yearly application of potash and phosphoric acid. For the former, experiments at the Massachusetts Agricultural College seem to indicate that the low-grade sulphate is the best form. If this is used 400 or 500 pounds ought to be applied per acre per year, and it is better applied as early in the season as possible and ploughed under. I should favor ploughing under all fertilizers, as it gets them down where the feeding roots are, and where they will be under such conditions as to make them most quickly available. Of course this is less important with the readily soluble fertilizers, but even with these I should favor turning them under.



The other two forms of potash used are the high-grade sulphate and the muriate, both of which are used very largely in orchards, and both of which are 50 per cent actual potash, and consequently one gets the required amount of potash with the least amount of material, and so with the least expense. Application of either should be 200 to 300 pounds per acre yearly.

In phosphoric acid one has the choice of several different forms, but probably the best two for the orchardist are Thomas phosphate or basic slag, and one of the superphosphates or acid phosphates. Where one is ploughing the land I should favor the use of the basic slag, as, in addition to the phosphoric acid, it contains a large percentage of lime, which will assist in putting the soil in good shape. It will run usually about 15 per cent to 17 per cent of phosphoric acid, and from experience in many orchards it seems to be an admirable form. On the other hand, where one is not able to plough the land, or for any reason has decided not to, the superphosphate is the best form of phosphoric acid, as it is readily soluble, and will therefore get down to the roots of the trees more quickly and more certainly than the basic slag. As to quantities per acre or per tree, a good yearly application of the slag would be from 300 to 400 pounds per acre, or on scattering trees from 8 to 10 pounds per tree. Where the superphosphates are used the quantity applied would vary with the source of the material from which they were manufactured, but probably should be from one-third to one-half less than of the basic slag. These quantities are merely suggested as the usual ones applied, and it should be borne in mind that there is little danger in applying an over-dose of either potash or phosphoric acid, as neither one leaches out of the soil to any extent, nor does either one, when present in moderate excess in the soil, produce the injurious effect on the orchard that an over-supply of nitrogen does. They should be applied as early in the spring as possible, and worked into the soil as much as is possible with the method of culture adopted.

We come now to the question of cover-crops for the orchard, by which is meant some crop grown in the orchard, usually late in the season, and exclusively, or at least mainly, with the object of improving the soil of the orchard. That it can be made to play a very important part in the upbuilding of an old orchard has been shown time and again. Some of the best ones for Massachusetts orchards are buckwheat, rye, soy beans, cow peas and the vetches. The chief advantages derived from their use would be that they take plant food away from the trees in the autumn and thus help to ripen them up; that they catch and hold nitrates in the soil after the growth of the trees has stopped, and when these substances would otherwise be washed out of the soil; that they help to pulverize and rot down the sod, which is especially important at the beginning; that when they are ploughed under they furnish humus, which in turn furnishes plant

food to the trees; and that in the case of soy beans, cow peas and the vetches they help to keep up the store of nitrogen in the soil by what they take up from the air and store in their roots. This is by no means all that these cover-crops do, but it covers the main points, and serves to show how important they are. The general plan of their use would be this: that the orchard would be ploughed as early in the spring as the soil would permit and thoroughly fitted as outlined earlier. Then thorough cultivation would continue up to the middle of July, when the cover-crop would be sown. The only important deviation from this course would be in the case of some of the leguminous cover-crops mentioned, particularly soy beans and cow peas, which often give better results if sown in drills earlier in the season, the last of June or the first of July, and cultivated several times before the orchard is laid by. Of course, the objection to this is that the cultivation by this method is much more costly, since it must be done with a one-horse cultivator, a row at a time, instead of with a disc or spring-tooth harrow, covering three or four times the space. But even this objection is often, if not usually, overbalanced by the much better growth of the cover-crop.

After cultivation ceases and the cover-crop is sown nothing further is done to the soil until the following spring, when the cover-crop is ploughed under, and the programme begins again. Where a good growth of one of the nitrogenous cover-crops can be secured it is often possible to obtain all the nitrogen needed for the orchard in this way.

I should feel inclined to begin with buckwheat as a cover-crop in starting an old orchard because it is peculiarly effective in rotting down sod and putting the soil in fine physical condition. This might be followed in a year or two with either soy beans, summer vetch or cow peas.

As to amounts of seed per acre of the different crops suggested the following will be found right for ordinary conditions:—

Buckwheat, . . . . .	1 bushel.
Rye, . . . . .	1½ bushels.
Soy beans, . . . . .	2 bushels broadcast; 1½ bushels in drills.
Cow peas, . . . . .	2 bushels broadcast; 1½ bushels in drills.
Summer vetch, . . . . .	1½ bushels broadcast; 1 bushel in drills.
Winter vetch, . . . . .	1 bushel broadcast; ¾ bushel in drills.

And lastly there is the question of top-grafting the trees. I have already said that I should consider the necessity of this a strong factor against the orchard, for it requires considerable time, two to four years, and not a little expense, to work over the trees into other varieties. But it frequently happens that odd trees in an orchard are of unsatisfactory varieties, and it is sometimes worth while to graft over an entire orchard where the trees are relatively young and otherwise in good condition. Where this is to be done I believe it is



generally advisable to employ an expert grafter or grafters to do the work. There is often a local artist who will undertake the operation, or, if the orchard is of sufficient size to warrant it, a professional grafter can be secured from a distance. In either case it is better business, and more satisfactory generally, to pay by the stub, and to have the grafter guarantee the scions to live. Of course in such a case one must have confidence enough in the man to insure that he will not put in grafts needlessly, but after all it is better to have too many grafts than not enough, and with a little knowledge and supervision on the part of the owner there is usually little difficulty on this score. If the owner is situated so that he can do so I should strongly advise his furnishing the scions himself, and too great care cannot be exercised in selecting them. They ought to be taken from bearing trees, and if possible from those of known productiveness, and they should be thoroughly well matured and not too long jointed. Let them be selected while the trees are still dormant, and stored in moist soil or sawdust in the coolest possible place; if an ice house is available so much the better.

A great many problems will undoubtedly come up in renovating an old orchard besides those which have been discussed, and modifications will have to be made to suit special fruits, such as peaches and plums, but if a campaign along the general lines indicated could be made among the old, and at present profitless, orchards of the State, either cleaning them up or cutting them down, it would certainly do a great deal toward putting Massachusetts fruit on a better footing with both dealers and consumers, and it would make an addition to the income of the farmers of the State by no means to be despised.









MASSACHUSETTS  
CROP REPORT

FOR THE

MONTH OF OCTOBER, 1908.

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STRAWBERRY GROWING.

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*ISSUED MONTHLY, MAY TO OCTOBER, BY STATE BOARD OF  
AGRICULTURE, STATE HOUSE, BOSTON, MASS.*

J. LEWIS ELLSWORTH, *Secretary.*

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ENTERED JUNE 3, 1904, AT BOSTON, MASS., AS SECOND-CLASS MATTER,  
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# CROP REPORT FOR THE MONTH OF OCTOBER, 1908.

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OFFICE OF STATE BOARD OF AGRICULTURE,  
BOSTON, MASS., NOV. 1, 1908.

Bulletin No. 6, Crop Report for the month of October, is presented as the final issue of the season. We wish to thank our correspondents for their faithful assistance, without which this publication could not be issued, and to assure them of our hearty appreciation. They have in no small measure been of assistance to the Board and to the agriculture of the State. We look forward confidently to their cheerful co-operation when another spring shall bring a resumption of the work.

The special articles printed this year have been: Bulletin No. 1, "Potato-growing suggestions," by Dr. Chas. D. Woods; Bulletin No. 2, "Some sheep topics for Massachusetts," by Ray L. Gribbin; Bulletin No. 3, "Drainage," by Prof. Wm. P. Brooks; Bulletin No. 4, "Artificial hatching and rearing of chickens as applied to 'South Shore roasters'," by Henry D. Smith; and Bulletin No. 5, "Renovating old orchards," by Prof. F. C. Sears. We have a limited number of Bulletins Nos. 2, 3 and 5 on hand, which we shall be glad to send to any one desiring them. The supply of Bulletins Nos. 1 and 4 is exhausted, but we shall reprint the articles on potato growing and hatching and rearing chicks some time next summer, and any requests for the same will be placed on file and filled as soon as possible.

We wish to call special attention to the article at the close of this bulletin, on "Strawberry culture," by Prof. F. A. Waugh, professor of horticulture at the Massachusetts Agricultural College. We have received a good many calls for information on this subject during the past year, showing that there is a good interest in it, which should be catered to; and, in addition, the article is such as to stimulate an interest in quarters where it has perhaps not previously existed.

### PROGRESS OF THE SEASON.

The Crop Reporting Board of the Bureau of Statistics of the Department of Agriculture (Crop Reporter for October, 1908) finds that the condition of the corn crop on October 1 was 77.8, as compared with 79.4 a month earlier, 78 on Oct. 1, 1907, and 79.7, the ten-year average on October 1. The decline in condition during September was thus about 2 per cent, compared with a decline of 2.7 per cent last year, and an average decline for the past ten years of 1.6 per cent.

The preliminary estimate of the average yield per acre of spring wheat is 13.2 bushels, compared with 13.2, the final estimate in 1907, and 13.8, the average of the past six years. The indicated total production of spring wheat is about 23,080,000 bushels, as compared with 224,645,000 bushels, the final estimate in 1907. The quality is 88.2, as compared with 88.8 in 1907, and 85.9, the average of the past six years. The production of spring and winter wheat combined is about 660,020,000 bushels, as compared with 634,087,000, finally estimated last year. The quality of all wheat is 89.4, as compared with 89.9 last year.

The average yield per acre of oats is about 24.9 bushels, as compared with 23.7 bushels, finally estimated in 1907, and 29.8, the average of the past ten years. A total yield of 789,161,000 bushels is thus indicated, as compared with 754,443,000, finally estimated in 1907. The quality of the crop is 81.3, against 77 last year, and 86.1, the average of the past ten years.

The yield per acre of barley is about 25 bushels, which compares with 23.8 bushels, the final estimate for 1907, and 25.5, the average of the past ten years. A total production of 167,482,000 bushels is thus indicated, as compared with 153,597,000 in 1907. The average quality is 89.3, against 88.2 last year, and 87.6, the average of the past ten years.

The average condition of buckwheat at time of harvest was 81.6, as compared with 87.8 on September 1, 80.1 at harvest in 1907, and 81.8, the average condition at harvest for the past ten years.



The average condition of potatoes on October 1 was 68.7, as compared with 73.7 on September 1, 77 on Oct. 1, 1907, and 76.3, the average of the past ten years on October 1. The condition on October 1 in important potato States was: Maine, 94; New York, 61; Michigan, 60; Wisconsin, 65.

The average condition of tobacco at time of harvest was 84.1, as compared with 84.3 on September 1, 84.8 at harvest in 1907, and 83.5, the average condition at harvest for the past ten years.

In Massachusetts the average condition of corn October 1 was 98; the average yield of oats 33 bushels, and the quality 91; the average condition of buckwheat 90; the average condition of potatoes 70; the average condition of tobacco when harvested 95; the average condition of apples 54; the average condition of cranberries 70; the average condition of tomatoes 95; the average condition of cabbages 88; the average condition of onions 89; and the average condition of beans 80.

#### MASSACHUSETTS WEATHER, 1908.

[FURNISHED BY WEATHER BUREAU, BOSTON.]

The weather of January was warmer than usual, the monthly temperature ranging from  $1^{\circ}$  to  $5^{\circ}$  above the average. The daily temperatures were generally in excess until near the close of the month, zero temperature prevailing on the 30th and 31st. The monthly precipitation was generally below the average. The snowfall was unevenly distributed through the month and over the State, in amounts ranging from 2 to 12 inches. At the close of the month there was little snow on the ground.

February was somewhat colder than the average, the temperatures ranging from  $1^{\circ}$  to  $5^{\circ}$  below the normal. The first decade was uniformly cold, but during the remainder of the month the only extremely low temperatures were on the 25th. The precipitation was generally above the normal, the snowfall ranging from 5 to 25 inches, the heavy storms being on the 5th and 6th.

The weather of March was warmer and more pleasant than usual. The temperature did not fall below zero at any time, and there were no marked extremes in either direc-

tion. The precipitation was of frequent occurrence, but the amounts were not excessive, the snowfall ranging from 3 to 10 inches, and at the close of the month the ground was bare.

The precipitation and temperature of April were below the normal, though the departures were not great in any section. The minimum temperatures occurred on the 4th and 5th. The precipitation was well distributed through the month, there being few days without measurable amounts in some section of the State. At the close of the month the season was considered somewhat later than the average.

The opening week of May was cold and unpleasant, but by the 10th the weather became warmer and generally seasonable, with sunshine near the average, and continued throughout the month, with slight exceptions. General moderate to heavy showers occurred on the 23d, and scattered local showers on several other days. The precipitation for the month as a whole was considerably below the average for the month of May.

June was exceptionally pleasant, with much sunny weather. The precipitation was deficient in about all sections of the State, while the temperature of the month was considerably above the average, the monthly means ranging from  $2^{\circ}$  to  $4^{\circ}$  above the June normal. There were no general rains during the month, the precipitation being the result of local showers and storms. At the close of the month vegetation was suffering from drought.

The drought continued uninterruptedly until the middle of July. From the 16th to the 20th, inclusive, showers were quite general, with rainfall ranging from light to copious. The rains of the latter half of the month were of great benefit to vegetation, and temporarily broke the drought. There was an unusual prevalence of sunshine during the month. The temperature was uniformly high, ranging from  $2^{\circ}$  to  $5^{\circ}$  above the normal, with temperatures above  $90^{\circ}$  on from ten to fourteen days.

From the 4th to the 7th of August there were frequent thunderstorms, with copious rainfall, which was of much benefit. Thundershowers again occurred on the 11th, 13th

and 17th, with rainfall from 1 to 2 inches, in western sections. On the 26th there was a heavy rainfall in the eastern part of the State. After the 26th fair and generally clear weather prevailed. The temperature was generally normal for the first ten days, above from the 11th to the 15th, and lower after that date, the average daily temperature for the last week being from 4° to 9° below normal.

The weather of September was very dry, with temperature normal to somewhat above. There was a severe drought, beginning the last week in August and continuing until the 28th of September, when there were general showers, with moderate to heavy amounts. The atmosphere became laden with smoke and dust, and the sun was at times wholly or partially obscured. The wind movement was less than usual, and the humidity excessive. The temperatures were without marked extremes, the days being warm and the nights cool.

#### WEATHER OF OCTOBER.

The conspicuous features of the weather of the month were the unusual prevalence of sunshine, and the almost entire absence of rain from the 3d to the 25th inclusive. The month was considerably warmer than usual, with the monthly mean temperature from 2° to 3° above the average for October. General showers that gave substantial amounts of rainfall occurred on the night of the 1st and on the 2d. These were followed by a renewal of the drought that had prevailed through September, there being no more rain, excepting scattered light showers and sprinkles on the 10th or the 11th, till the 26th, when light to moderate amounts fell in all sections. General rains of still larger amounts fell on the 29th and 30th, and these, following so soon those of the 26th, served to quite effectually end the drought. There is, however, much need of copious rains before the setting in of winter, to make up the several inches of deficiency. The average rainfall of the month was generally considerably below the normal for October. The month opened with several days of cool weather, followed by temperatures generally above the seasonal average from the 7th to the 19th. A cool spell prevailed from the 20th to the 23d, during which



the lowest temperatures of the month occurred, with frosts in all sections and moderate freezes in some localities. The closing week was warmer than the average October weather. The highest temperatures were generally on the 17th and the 18th, when they ranged near 80° in about all sections. The month as a whole was exceptionally pleasant.

#### CROPS OF THE YEAR.

May closed fully up to the average, both as to work and vegetation. Feed in pastures was slow in starting. Grass in mowings was generally in excellent condition, though there was a good deal of winter-killing, particularly of fall seeding. The fruit bloom was reported as extremely heavy for all fruits, except peaches, with no frosts doing damage. Very little damage was reported from insects. Planting progressed slowly, but was at its height at time of making returns. Farm help was considerably easier to secure than for several years past, with wages not quite as high as formerly. The acreage of cultivated crops, particularly corn and potatoes, was considerably increased. The acreage of tobacco suffered a slight decrease, but that of onions was slightly increased.

Insects were rather less injurious than usual in June. The acreage of Indian corn was considerably increased, and the crop, though planted late, germinated well, and was of good stand and color. Grass got a good start in May, but suffered during June from drought. Early potatoes were in excellent condition, apparently, but in need of rain. Early market-garden crops generally gave good yields, but prices were very low. The flow of milk was well maintained, and prices of dairy products were higher than usual. Feed was shortened by the dry weather, but was revived by showers in the closing days. An average crop of strawberries was secured, and other berries promised well. Peaches and plums did not set well, but there was a good set of apples for a non-bearing year.

Insects were again less numerous and destructive than usual in July. Indian corn was in excellent condition, not suffering to any extent from drought. The hay crop was



practically all secured at time of making returns, and was generally less than an average crop, probably about three-fourths. In most sections there was the usual amount of forage crops, but in the southeastern counties they were little sown, owing to the ground being too dry. Market-garden crops suffered severely from drought, with low prices. Very few potatoes had been dug, but the crop was expected to be very light. Apples promised only a light crop; pears, peaches and plums were even more unfavorable. Quinces were somewhat better; grapes set full; cranberries suffered from drought. Feed in pastures was very short in all sections. Rye, oats and barley escaped the worst effects of the drought, and were fair crops.

The promise for the corn crop was exceptional in the latter part of August. Ensilage corn was in good condition, and promised to be unusually well eared. The rowen crop promised to be very light, except on naturally moist land. Late potatoes did not promise well, blight and rot being reported, and the tubers being small and few in the hill. Tobacco was damaged by hail and wind in some sections, but otherwise a first-class crop was secured. The rains of the early part of the month brought pasturage forward rapidly, and it was generally in good condition. Apples continued to deteriorate in condition, and dropped badly. Pears, peaches and plums were light crops; quinces somewhat better, but hardly average; grapes excellent; cranberries considerably below the normal. Oats were below the normal; barley excellent as a late forage crop. Root crops are grown extensively in eastern sections, and appeared to be in good condition.

September showed the corn crop to be a remarkably good one, both for grain and stover. Rowen was a light crop in all sections, and feed in pastures was very short. The drought prevented anything like the usual amount of fall seeding being done; that sown early germinated well and was in good condition. Onions were a good crop, particularly in the Connecticut valley, the only drawback being small size in some cases. Potatoes are estimated at from one-third to one-half a normal crop, blight and early drought being the principal causes of the decline. Root crops were hardly nor-

mal, also celery, both suffering from drought; vines of all kinds did well. Apples are a light crop, small in size and prematurely ripened. Pears rather better than expected; peaches generally light; grapes a heavy crop, with no damage from frost; cranberries a light crop, with small berries and more or less damage from insects.

In the circular to correspondents returnable October 27 the following questions were asked:—

1. What is the value of the corn crop, compared with a normal crop?

2. Have root crops proved to be average crops?

3. What is the condition of farm stock?

4. What is the condition of fall seeding?

5. How have prices for crops raised for market compared with former years?

6. Which of the leading crops in your locality do you think have been most profitable?

7. Which of the leading crops in your locality do you think have been least profitable?

8. Considered as a whole, has the season been a profitable one for your farmers?

9. What is the effect of the drought on vegetation, streams, springs and wells?

Returns were received from 128 correspondents, from which the following summary has been made:—

#### VALUE OF THE CORN CROP.

The corn crop was as valuable as that of any year within the recollection of the correspondents. It seemed to thrive on the hot, dry weather of the summer, the showers of late July and August bringing it through the summer in good condition, and the hot, dry weather of September maturing both the grain and stover in excellent shape. The high price of grain also tends to make the crop more valuable than usual. As a silo crop it is also peculiarly valuable, as it is well eared out, and was secured practically without any damage from frost. More was planted than usual, and an unusually large and valuable crop secured.

### ROOT CROPS.

Root crops were rather below the average, taking the State as a whole, as comparatively few correspondents report them as above average, while 55 consider them to have been below. They developed wonderfully well when the prolonged drought is considered, and were very far from being a failure, as would perhaps have been expected, but were nevertheless considerably reduced in yield. Potatoes, sometimes classed as a root crop, though not properly included in that class, were a light crop in all sections, but brought good prices.

### FARM STOCK.

Pastures were very dry and short during September and October, and young stock generally came to the barns in rather poor flesh. Milch cows have been fed at the barns ever since the middle of September in most sections, and therefore remained in good condition and kept up a good flow of milk. What the effect of the shortage in fall feed will be in the future remains to be seen. Certainly the supply of hay has been reduced on many farms, and, as the crop was not a heavy one, this would naturally lead to a cutting down of the number of cattle to be carried through the winter.

### FALL SEEDING.

Much less than the usual amount of fall seeding has been done, owing to the excessive drought, which made ploughing unwise on many fields, and also reduced the chances of germination so such an extent that few ventured upon the operation. That which was put in early and germinated during August and early September seems to have done well in spite of the drought, and to be in fairly good condition. That put in later failed to germinate fully in most cases, and has made little progress.

### PRICES.

Prices for crops raised for market, as indicated by the returns, average about the same as in former years, though if there has been any movement it has been in the downward direction, and there would certainly seem to be a recession

from the high prices of last year. Of the 113 correspondents answering this question, 21 speak of prices as higher than usual, 66 as average or about average, and 26 as lower than usual.

#### MOST PROFITABLE CROPS.

Sixty-one correspondents, a bare majority, consider corn to have been among the most profitable crops; 53, hay; 14, potatoes; 7, onions; 5, tobacco; 5, cranberries; 4, strawberries; 4, cabbages; 4, tomatoes; 3, oats; 3, fruit; 3, asparagus; 3, sweet corn; 2, apples; 2, forage crops; 2, celery; 2, berries; 2, cauliflower; 2, peaches; 1, garden crops; 1, peas; 1, milk; 1, squashes; 1, beets; and 1, turnips.

#### LEAST PROFITABLE CROPS.

Seventy-six correspondents, considerably over a majority, consider potatoes to have been among the least profitable crops; 19, apples; 8, hay; 5, tomatoes; 4, beans; 3, cabbages; 2, fruit; 2, squashes; 2, carrots; 2, sweet corn; 2, root crops; 2, milk; 2, turnips; 1, barley; 1, late vegetables; 1, late cabbages; 1, grapes; 1, cauliflower; 1, cucumbers; and 1, strawberries.

#### PROFITS OF THE SEASON.

There appears to be a wide variation of opinion as to whether the season has been a profitable one. The general determination would appear to be against its having been profitable. Some of the reasons given are the prolonged drought, short crops, low prices, and especially the high price of grain and other supplies. Of the 120 correspondents answering this question, only 1 considers the season to have been unusually profitable; 14 call it an average season for profit; 18 say that it was fairly profitable; 35, that it was a profitable season; while 11 say that it was below the average for profit; and 41 flatly state that it was not a profitable season.

#### EFFECTS OF DROUGHT.

The prolonged drought seems to have had very little effect upon vegetation, crops generally having progressed so far as to be beyond its worst influences. It undoubtedly shortened



the growth and reduced the size of late vegetables, but otherwise had little effect on crops. The streams, springs and wells were very low at the time of making returns, many having failed altogether. A large number of farmers were forced to draw water long distances, for both stock and domestic uses. The rains of the last week of the month had a beneficial effect, but much more precipitation is needed to replenish the underground water supply and again fill the springs and wells which have failed. The condition still continues to be serious, from the farm standpoint.

## NOTES OF CORRESPONDENTS.

(Returned to us October 27.)

## BERKSHIRE COUNTY.

*New Marlborough* (E. W. RHOADES). — There was an extra heavy corn crop, which is nearly housed. Root crops have turned out well. Stock is in fair condition. On account of dry weather, fall seeding makes little show. There is much call for potatoes, at good prices. People here consider corn the most profitable crop this year. Farmers in this vicinity have had a profitable year. Streams and springs have gone dry in many instances.

*Lee* (A. BRADLEY). — The corn crop is 100 in value, when compared with the normal. Farm stock is in bang-up condition. Prices for crops raised for market have ranged about 5 per cent below former years. Hay has been our most profitable crop and apples our least profitable one. Considered as a whole, the season has been a profitable one. Vegetation has suffered somewhat from drought, and springs and streams considerably.

*West Stockbridge* (J. S. MOORE). — The quality and price received for the corn crop is much above the normal. Root crops have been below the average, especially potatoes. Farm stock is in good condition. Fall seeding is not as forward as it should be, owing to drought. Prices for crops raised for market have been higher than usual. Hay, now selling from \$16 to \$20 per ton, has been our most profitable crop, and corn next. Potatoes have been our least profitable crop. The season has been a profitable one for our farmers. The drought has kept seeding back and cut off fall feed. In many cases farmers have been obliged to haul water one or two miles, or drive stock to streams once or twice daily.

*Tyringham* (EDWARD H. SLATER). — The corn crop has been better than the average. Root crops have done well the past season. Farm stock is not in as good condition as usual, owing to dry weather. Fall seeding is looking well. Prices for crops raised for market have been a little below those of previous years. The hay crop has been the most profitable one for our farmers, and potatoes the least profitable. Considered as a whole, the season has been a profitable one. The drought has had some effect on vegetation, and springs and streams are very low.

*Richmond* (TIMOTHY B. SALMON). — The corn crop is above the average in value. Root crops are up to the usual average. Farm stock is in very good condition. Very little fall seeding has been done, and dry weather has prevented growth. Prices for crops raised for market are up to the average. Hay and corn have been our most profitable crops, and potatoes and barley our least profitable ones. Considered as a whole, the season has been a profitable one for our farmers. Vegetation looks brown and dead; streams and springs are very low and half of them dry.

*Hancock* (B. H. GOODRICH). — The corn crop is more valuable than usual, especially the stover. Farm stock is in normal condition. Fall seeding has been injured by drought. The prices for crops raised for market have been above normal. Corn has been our most profitable crop, and apples our least profitable one. Considered as a whole, the season has been about an average one for profit. Springs and wells are very low, but have not failed to any extent.

*Hinsdale* (THOS. F. BARKER). — The corn crop is not over half the normal in value. Root crops are not up to the average, and are little raised. Farm stock is not in good condition, the drought having been too severe. No fall seeding has been done. Prices for crops raised for market are about average. Oats and potatoes have been our most profitable crops, and apples our least profitable one. Considered as a whole, the season has not been an average one for profit. Vegetation has suffered a great deal from drought, and many farmers have to draw water for their stock.

*Windsor* (HARRY A. FORD). — The corn crop was never better. Root crops are up to the average. Farm stock is looking well, but has to be watered in some cases. Fall seeding is in good condition. Prices for market crops have been up to the average. Potatoes have been our most profitable crop. Considered as a whole, the season has been a profitable one. Some springs and wells are dry that have never failed before.

*Cheshire* (L. J. NORTHUP). — The corn crop is above the normal. Root crops are normal crops. Farm stock is looking well, considering the fall drought. Fall seeding is not up to the average. Prices for crops raised for market have been well sustained. The hay crop is our leading and most profitable crop, and the potato crop seems to have been the least profitable. The season as a whole has been all that our farmers could ask for. The effect of the drought on streams is very marked; vegetation had so matured that no effects were perceivable.

#### FRANKLIN COUNTY.

*Monroe* (DAVID H. SHERMAN). — Corn is little raised here, but is a very good crop. All root crops yield well, and are of fine quality. Farm stock is looking well, though drought has pinched pastures. Prices for crops raised for market have ranged above the average. Hay

and potatoes have been our most profitable crops, and apples our least profitable one. The season has been a profitable one, considered as a whole. Vegetation has stood the drought very well, but streams, springs and wells are very low.

*Charlemont* (J. M. J. LEGATE). — Yield and price taken into account, the corn crop is double the normal in value. Root crops are little raised. Stock will come into the barns thin in flesh, owing to the drought. Fall seeding is in very poor condition, owing to drought. Prices for crops raised for market are fully up to the average. Hay has been our most profitable crop, and potatoes our least profitable one. Owing to the drought and the high prices of grain, the season has not been a profitable one. Streams are very low, and springs and wells are drying up; fields are brown, and a week's steady rain is needed.

*Gill* (F. F. STOUTON). — The corn crop is above the normal in value. Root crops are not much raised. Fall seeding is good on moist land, and poor elsewhere. Farm stock is in good condition. Corn is our most profitable crop, and potatoes and winter apples our least profitable one. Streams and springs are low, although we have not suffered as much as in some localities.

*Ashfield* (ALBERT HOWES). — Corn is ten per cent above the normal in value. But few root crops are raised, and they are hardly up to the average. Farm stock is not in as good condition as usual. Fall seeding does not look well, owing to dry weather. Prices for crops raised for market are about average, and some a little better. Apples have been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been about normal for profit, although the high prices of grain have cut profits on dairy products. The drought has been severely felt, though not as much as in surrounding towns.

*Deerfield* (DWIGHT A. HAWKES). — The value of the corn crop is above the normal. Farm stock is in good condition. Fall seeding is in good condition. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. The drought has not hurt vegetation, and while water is low, we still have plenty.

*Montague* (A. M. LYMAN). — The corn crop is much above the average in value. Root crops are fairly profitable. Farm stock is in good condition where it has been fed from the barn. Fall seeding looks well, and it has been a good time to re-seed low lands. Prices for crops raised for market have not been as good as usual. Corn has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has hardly been an average one for profit. The drought shortened rowen and fall feed, and many streams, springs and wells are very low.

*Wendell* (N. D. PLUMB). — The corn crop is fully one-fourth above the normal in value. There was a very large yield of roots, but the



drought has kept them small. Farm stock is looking well. Fall seeding is very backward, owing to the drought. Prices for crops raised for market are above the normal. Corn and potatoes have been our most profitable crops, and hay and oats our least profitable ones. Considered as a whole, the season has been profitable; our staple product, potatoes, brought very high prices. The drought is the worst for twenty-five years.

*Erving* (CHARLES F. CLARK). — The value of the corn crop is greater than the normal. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is rather poor. Prices for crops raised for market are rather poor. Hay and corn have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been a fairly profitable one. Vegetation, wells, springs and streams have been badly affected by drought.

*Orange* (A. C. WHITE). — The corn crop is good, and prices high. Root crops are up to the usual average. Farm stock is not up to the standard in condition, and shows the effect of short pastures. But little fall seeding has been done, on account of lack of rain. The weather has been ideal for securing crops, but does not balance the effect of the drought. Wells and springs that never before failed have given out, and streams are very low.

#### HAMPSHIRE COUNTY.

*Ware* (J. H. FLETCHER). — The corn crop is above the normal in value, as it is high in price. Farm stock is in very good condition. Not as much fall seeding has been done as in former years, because of drought, but some are seeding now. Prices for crops raised for market have been up to the normal. Hay and corn have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. Streams, springs and wells are very low.

*Greenwich* (W. H. GLAZIER). — The corn crop is fully 100 in value. Root crops are not grown to any amount. Farm stock is looking well, many having been fed at the barn for some time. But little seeding has been done this fall; what there is is looking well. Potatoes are selling for 90 cents a bushel, being our chief money crop. Hay, corn and potatoes have been our most profitable crops. The season has been a fairly profitable one. Streams are very low, springs dry in some cases and wells giving out.

*Pelham* (J. L. BREWER). — The corn crop is 10 per cent above the normal in value. Root crops are good average crops. Farm stock is generally in fair condition. Fall seeding shows a good stand. Prices have been fair for crops grown for market. Corn and grass have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one. Streams are low, and some springs and many wells are dry.

*Amherst* (WM. P. BROOKS). — The corn crop is much above the normal in value, the acreage being large, the yield heavy and price high. Root crops are unimportant here, but show average yields. Fall seeding is poor as a rule, having either not started at all or made but little growth. Potatoes bring high prices; other crops rather low, especially squashes. Onions, tobacco (if it sells as anticipated), corn and hay have been our most profitable crops; potatoes have generally been our least profitable crop. Considered as a whole, the season has been a profitable one for our farmers. The drought has made pastures short and rowen light; streams and springs are low.

*Hadley* (H. C. RUSSELL). — The corn crop is 10 per cent above the average in value. Root crops are average crops. Stock is coming in from pasture in poor condition. Fall seeding is below the average, owing to dry weather. Prices for market crops have averaged about as usual; potatoes are higher, owing to short crop. Onions have been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. Streams were never so low, and wells and springs have given out in some cases.

*Easthampton* (WM. C. CLAPP). — The corn crop is about normal in value. Root crops are good on moist land. Farm stock is looking well. Fall seeding is looking well on low lands, but has dried up on uplands. Hay, corn and onions have been our most profitable crops, and potatoes and late cabbages our least profitable ones. Considered as a whole, the season is hardly up to the average for profit. Vegetation in pastures is dried up, and streams, springs and wells are low.

*Westhampton* (LEVI BURT). — Corn is fully average in value. Root crops are not raised to any extent. Farm stock is looking well. Fall seeding is in excellent condition. Prices for market crops are fully up to the average. Corn has been our most profitable crop. It is hard to select the least profitable one; there is no great profit in any. Considered as a whole, the season has been a profitable one. Streams, wells and springs are very low, and many have to draw water from a distance.

*Goshen* (ALVAN BARRUS). — The corn crop is very near the normal in value. Root crops are good average crops. Farm stock is in good condition. Fall seeding looks well on moist land. Prices for crops raised for market have averaged about as usual. Hay is our most profitable crop, though light. Considering the scarcity and high price of help, the season has not been a profitable one. Vegetation, streams, springs and wells are all below par, and many are carting water for home and barn use.

*Middlefield* (J. T. BRYAN). — The corn crop is above the average in value. Root crops are up to the usual average. Farm stock is in excellent condition. No fall seeding has been done, owing to dry weather. All crops have brought good prices. Hay has been our most profitable crop. Considered as a whole, the season has been a profit-

able one. Vegetation has suffered from drought, but not enough to seriously affect crops. Streams, springs and wells are low, but there has been little hardship from this as yet.

### HAMPDEN COUNTY.

*Blandford* (ENOS W. BOISE). — Corn has seldom been a better or more valuable crop. Root crops are not up to the average. What little fall seeding has been done is in poor condition. Farm stock is in fair condition. Prices on all farm crops have been fairly satisfactory. Grass and corn have been our most profitable crops, and apples and potatoes the least profitable. As a rule, farmers should not complain of the season. Drought has stunted vegetation, streams are very low and many springs and wells dry.

*Russell* (E. D. PARKS). — The corn crop is fully up to the average in value. Root crops are below the average. Farm stock is not in very good condition. Fall seeding is not starting well, on account of dry weather. Prices for crops grown for market have been up to the average. Hay and corn have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. The drought has been very severe, and cows are not producing milk and butter up to the average.

*Agawam* (J. G. BURR). — The corn crop is the best we have had for some time. Root crops are not quite up to the average. Farm stock is in good condition. Some fall seeding is good, and some has suffered from drought. Prices for crops raised for market are about the same as usual. Hay, corn and potatoes have been our most profitable crops, and root crops the least profitable. The season has been a profitable one. Streams and wells are very low, and some have dried up. Tobacco is a good crop, but is not yet sold.

*West Springfield* (T. A. ROGERS). — Corn is high in price, and the crop fully up to the normal in value. Root crops are about average crops. Farm stock is generally looking well. Fall seeding is growing slowly, on account of drought. All crops have sold above the average. Hay has been our most profitable crop, and fruit, especially apples, our least profitable one. The season is hardly up to the average for profits. Late vegetables suffered somewhat from drought, but streams and springs are not as low as would be expected.

*Chicopee* (E. L. SHAW). — Corn is well eared and ripened, and is a little above normal in value. All roots are fair crops. Farm stock is looking well. Fall seeding is slow in starting and uneven. Prices for market crops have ranged about as usual. Hay and corn have been our most profitable crops, and potatoes our least profitable one. The market has been slow, and the season not a profitable one. Vegetation has not suffered much from drought; streams and springs are low, but every one has water enough,



*Ludlow* (CHAS. B. BENNETT). — The corn crop is above the average in value. Root crops have proved to be up to the usual average. Farm stock is in very good condition. Hardly any fall seeding has been done, and little of it has come up. Hay has been our most profitable crop. Potatoes are but half a crop, and of poor quality. The season has been about an average one for profit. Streams are very low, but the drought came too late to harm vegetation.

*East Longmeadow* (JOHN L. DAVIS). — The corn crop must be a third above the normal in value. Root crops are not over 50 per cent of the normal. Farm stock is in good condition, except young stock. Fall seeding is in worse condition than ever in my experience. Corn has been our most profitable crop, and potatoes our least profitable one. The season has not been a profitable one. Vegetation is burned from drought, streams are low and springs dry.

*Wilbraham* (HENRY M. BLISS). — The corn crop is fully up to the normal in value. Potatoes are 60 per cent of an average; other root crops 80. Farm stock is in good condition. Fall seeding is in very poor condition. Corn and garden crops have been our most profitable crops, and apples and potatoes our least profitable ones. The season has not been a profitable one. The drought has checked the growth of all vegetation.

*Palmer* (O. P. ALLEN). — The corn crop is about 10 per cent below the normal in value. Root crops are rather below the average. Farm stock is in fair condition. Fall seeding is in poor condition. Prices for crops raised for market are somewhat higher than usual. Corn has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has not been quite as profitable as usual. The drought has had a bad effect upon late vegetation, and streams, springs and wells are badly affected.

## WORCESTER COUNTY.

*Brookfield* (FRANK E. PROUTY). — The corn crop is excellent in this vicinity. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition, but the dry weather has checked it. Prices for market crops are about average. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been about an average one for profit. Drought has checked vegetation, and streams and springs are low.

*West Brookfield* (MYRON A. RICHARDSON). — The corn crop is the best for years. Root crops, except field turnips, have been more than normal crops. Farm stock has done well, and is in good condition. Fall seeding started well, but has been at a standstill, for want of rain. Prices for crops raised for market are about as usual. The corn crop has been our most profitable crop, and field turnips our least profitable



one. The season has been an unusually profitable one. Drought has affected pastures, and streams are low, but no great injury has been done by it.

*New Braintree* (CHARLES D. SAGES). — Corn is better than usual. Root crops are little grown. Farm stock is not in quite as good condition as usual, owing to the drought. Very little fall seeding has been done. Prices for market crops are about average. Hay, corn and oats have been our most profitable crops, and apples our least profitable one. Considered as a whole, the season is fairly profitable. Streams have held out very well, and the dry weather affected pastures and mowings very little.

*Barre* (JOHN L. SMITH). — The corn crop is 10 per cent above the normal in value. Farm stock is thin in flesh. Little fall seeding has been done, on account of dry weather. Hay and corn have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been an average one for profit. Vegetation has made little growth; streams and springs very low, but few failures.

*Royalston* (C. A. STIMSON). — The corn crop is 95 per cent of the normal in value. Root crops are not up to the usual average. Farm stock is in poor condition. Fall seeding is in very poor condition. Crops raised for market have brought good prices. Corn has been our most profitable crop, and beans and potatoes our least profitable ones. Everything is dried up from the prolonged drought.

*Princeton* (A. O. TYLER). — The corn crop is about normal in value. Root crops are up to the usual average. Farm stock is not quite as good as usual, owing to the unfavorable season. Fall seeding is about in average condition. Prices for crops raised for market have been very low, except for potatoes. Potatoes and corn have been our most profitable crops, and squashes and cabbages our least profitable ones. Considered as a whole, the season has not been a profitable one. Wells and streams are drying up, but vegetation has not suffered very much.

*Hubbardston* (CHAS. C. COLBY). — The corn crop is the best for several years. Root crops are very good. Stock will come to the barns in good condition. Early fall seeding is looking finely. Prices for market crops have been about the average for the past few years. Hay and corn have been our most profitable crops, and potatoes our least profitable one. In the dairy section the season has not been satisfactory. Our farmers are complaining of shortage of water supply.

*Fitchburg* (Dr. JABEZ FISHER). — Root crops are average yields. Drought has held fall seeding back. Prices for crops raised for market have been average. Fruits have been our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season has been fairly profitable. The usual growth of vegetation is somewhat lacking; fruit buds are not abundant upon apples and pears; streams, springs and wells are unusually low.

*Sterling* (HENRY F. SAWYER). — The corn crop is 90 per cent of the normal in value. Root crops are 25 per cent below the normal. Stock is generally looking well. On account of the dry weather, fall seeding will generally prove a failure. Prices for crops are about average, with potatoes a little higher. Hay has been our most profitable crop, and potatoes our least profitable one. The season has been below the average for profit. Crops suffered for want of rain, and streams are low and wells dry.

*Bolton* (H. F. HAYNES). — The corn crop is fully up to the normal in value. Farm stock is in very good condition. Fall seeding looks well, considering the dry weather. Prices for crops raised for market have been full average. Hay has been our most profitable crop. The season has been a profitable one. Small brooks are dry, many wells have given out, and many farmers have trouble to get water for their stock.

*Worcester* (H. R. KINNEY). — Sweet corn sold very low, and there was less ensilage raised than usual. Root crops have given good yields, but low prices. Farm stock is in fair to good condition. Fall seeding is looking well on moist land. As a whole, prices have ruled lower than for a number of years. Fruit has given the best return, especially strawberries, and potatoes were our least profitable crop. The season has not been a profitable one, owing to slow sales and low prices. Water is rather low, but we have not had much trouble, and vegetation has not suffered as much as would be expected.

*Northborough* (J. K. MILLS). — The corn crop is above normal in value. All roots have grown well. Stock is in very good condition, with few exceptions. Fall seeding has not done as well as usual, owing to drought. Prices for crops raised for market have been lower than for the past two years. Corn, potatoes, asparagus, cabbage, onions, peaches, tomatoes and peas have been our most profitable crops. Apples, squashes, beets, carrots, turnips, sweet corn, shell beans and grapes have been our least profitable crops. The season has been profitable, in the sense that our farmers have made both ends meet. Streams and wells are very low; pastures and mowings are very dry.

*Mendon* (J. J. NUTTER). — The corn crop is fully up to the average. Root crops are not quite up to the average. Farm stock is in very good condition. Fall seeding is not very good, owing to the drought. Prices for crops raised for market are fully up to the average. Hay has been our most profitable crop, and potatoes our least profitable one. The season has been about the same as usual for profit, but not what it should be.

*Blackstone* (O. F. FULLER). — The corn crop is worth considerably more than last year. Root crops are up to the usual average. Farm stock is in fair condition. Fall seeding is in good condition. The prices of some crops have been a little higher than usual. There is a difference of opinion as to the most and least profitable crops. The

season has not been profitable, owing to the high price of grain and feed stuffs. On the farms there is a good supply of water, but in the village it is short.

#### MIDDLESEX COUNTY.

*Hopkinton* (W. V. THOMPSON). — The corn crop is above the normal in value. Root crops are not up to the average. Stock kept in the barn looks well, but those coming in from pastures are thin in flesh. Fall seeding has not made much growth, owing to drought. Prices of crops raised for market are rather higher than usual. Corn has been our most profitable crop, and potatoes and root crops our least profitable ones. The season has not been remarkably profitable, the corn crop being the bright feature. Everything is dry, with a big D.

*Marlborough* (E. D. HOWE). — The corn crop is fully up to the normal in value. Root crops are average crops. Farm stock is in good condition. Fall seeding needs rain to start. Potatoes are somewhat higher in price than usual; squashes cheaper; other crops about average. Peaches have been our most profitable crop, and potatoes our least profitable one. The drought has been unusually severe.

*Sudbury* (EDGAR W. GOODNOW). — The corn crop is about up to the average. Root crops are below the average. Farm stock is looking well. Fall seeding is in need of rain. Crops for market have sold low, compared with former years. Celery and onions have been our most profitable crops, and tomatoes and sweet corn our least profitable ones. Wells and springs are running dry.

*Stow* (GEO. W. BRADLEY). — The corn crop is a little above the average in value. Root crops are not as good as in some years. Farm stock is not quite up to the average. Very little fall seeding has been done, and it does not look very well. Crops have sold well, about as in former years. Corn has been our most profitable crop, and hay and potatoes our least profitable ones. Considered as a whole, the season has been a profitable one. Vegetation is very dry, and the water supply is getting quite low in most places.

*Westford* (J. WILLARD THATCHER). — Corn is a very good crop here. Farm stock is in good condition. Fall seeding is in poor condition. Prices for crops raised for market are below the average. Berries have been our most profitable crop, and potatoes our least profitable one. The season has not been a profitable one. Wells are all dry and streams are very low.

*Townsend* (G. A. WILDER). — The corn crop is about normal in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market are little higher than usual. Fruit has been our most profitable crop. Considered as a whole, the season has been a profitable one. Springs and wells are very low. Fruit, etc., ripened too early and is not keeping well.

*Dunstable* (A. J. GILSON). — The corn crop is above the normal in



value. Root crops have generally proved about average crops. Farm stock is in good condition. Fall seeding is very backward, because of drought. Crops raised for market have sold lower than in former years. Corn has been our most profitable crop, and potatoes our least profitable one. Not much profit, beyond a living, is expected from farming in this section. Vegetation has ripened prematurely, and streams and springs are unusually low; some wells are dry, and others nearly so.

*Concord* (WM. H. HUNT). — The corn crop is a little below the average in value. Root crops are rather below the average. Farm stock is in good condition, having been fed at the barn. Prices for crops raised for market are not quite up to the average. Asparagus and strawberries have been our most profitable crop, and potatoes, apples and cabbages our least profitable ones. The season has not been a profitable one, as a whole. Springs and wells were never so low. Fall seeding has suffered severely. Cabbages and cauliflowers have not filled out as they should.

*Winchester* (S. S. SYMMES). — No Indian corn is raised here. Root crops are not quite up to the average. All stock has been fed in the barn for weeks. Fall seeding has not made much growth. Prices are very much lower than ever before. Sweet corn has been our most profitable crop, and cauliflower our least profitable one. Hardly a farmer in this section has paid expenses. Savoy cabbage are nearly a total failure. Brooks and springs dry for weeks past. The drought has been favorable to insect pests.

*Newton* (G. L. MARCY). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is late. Prices for crops raised for market are lower than usual. The season has not been a profitable one for our farmers. The Charles River is very low. The season has been a very trying one, with two severe droughts, and low prices, while grain and labor remain high.

## ESSEX COUNTY.

*Salisbury* (WESLEY PETTENGILL). — The corn crop is 25 per cent above the normal in value. Root crops are not up to the usual average. Farm stock is in good condition, considering the dry season. Fall seeding is in poor condition, owing to dry weather. Prices average about as in former years; No. 1 Baldwin apples bring \$1.75 per barrel, squashes \$5 to \$7 a ton. Hay and corn are our most profitable crops, and potatoes our least profitable one. Considered as a whole, the season is an average one for profit. Vegetation has suffered from drought on some land; streams have mostly dried up, springs are very low and many wells are dry.

*Amesbury* (F. W. SARGENT). — Corn is at least 25 per cent above the normal in value. Root crops are below the usual average. Farm stock is generally thin in flesh, and in low milking condition. Fall



seeding is uneven, because of drought. Prices for market crops have been satisfactory. Our farmers carry on a mixed business, — dairy-ing, fruits and vegetables; and it is hard to tell which have paid the most profit, if profit has been realized. The season has not been a profitable one, as the cost of production and small yield have made the margin small.

*Groveland* (A. S. LONGFELLOW). — There is an unusually good crop of corn. Root crops are below the average, on account of drought. Farm stock is in good condition. Prices for crops raised for market are rather lower than in previous years. Fall seeding is in very poor condition, much seed failing to germinate. Corn, hay and apples have been our most profitable crops, and potatoes and tomatoes our least profitable ones. The season has been profitable for dairymen, and not so good for market gardeners. All streams, springs and wells are very low.

*Wenham* (N. P. PERKINS). — Corn is little raised, except for the silo, but is in good condition. Root crops are below the average. Farm stock is rather thin in flesh, as a rule. Fall seeding germinated slowly and is backward, but is looking well. Prices for crops raised for market have been low, though yields are small. Sweet corn, squashes, beets and hay have been our most profitable crops, and cabbages, carrots, tomatoes and milk our least profitable ones. The season has not been a profitable one, up to date. I do not remember any time when the streams and ponds were lower, but we have managed to squeeze through.

*Danvers* (CHAS. H. PRESTON). — There is nearly an average crop of corn. Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices as a whole have been lower than the average. Considered as a whole, the season has not been a profitable one. Nearly all crops were affected by drought; streams, springs and wells are either very low or dry.

## NORFOLK COUNTY.

*Stoughton* (CHARLES F. CURTIS). — The value of the corn crop is about 20 per cent higher than the normal. Root crops are fully up to the average. Farm stock is in fair condition. Fall seeding has come up and is growing exceedingly well, in spite of the drought. Crops raised for market brought the usual prices. Hay has been our most profitable crop, and potatoes our least profitable one. The season has been a fairly profitable one. The town has not suffered much from drought, though a few wells have gone dry.

*Canton* (EDWIN V. KINSLEY). — Corn is above the average, both as grain and fodder. Root crops are not quite up to the average. Farm stock is in fair to excellent condition. Fall seeding is late and backward in growth. Prices for crops raised for market are fully up to the average. Corn has been our most profitable crop, and potatoes our

least profitable one. The season has hardly been an average one for profit. Wells are low, streams have dried up and springs are low. Milk is a little short.

*Westwood* (HENRY E. WEATHERBEE). — The corn crop is above the normal. Root crops are not up to the average. Farm stock is in very good condition. Fall seeding is not in very good condition, owing to the drought. Prices for crops raised for market have been a fair average. Tomatoes have been our most profitable crop, and potatoes our least profitable one. The season has not been a profitable one. Springs, streams and wells are very low and vegetation very dry.

*Walpole* (EDWARD L. SHEPARD). — The corn crop is about 85 per cent of the normal in value. Root crops are not good average crops. Farm stock is in fairly good condition. Fall seeding is about normal. Prices are about as usual. No one has made more than a living at farming this season. Crops have done fairly well, in spite of the drought, but springs and wells are dry for the first time in twenty-five years.

*Franklin* (C. M. ALLEN). — Corn is very high and above the normal in value. Root crops are up to the usual average. Farm stock is in fine condition. Owing to the drought, fall seeding has made a poor showing. Crops raised for market are above the average in price. Corn has been our most profitable crop, and potatoes our least profitable one. Help has been so high that there has been no profit in farming. The drought has done less damage than in many other years.

*Bellingham* (JOHN J. O' SULLIVAN). — The corn crop is above the average in value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition, but needs rain badly. Prices for market crops have been about the same as usual. Hay has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been an average one for profit. Everything is badly dried up.

## BRISTOL COUNTY.

*Mansfield* (WM. C. WINTER). — The corn crop is presumably above the normal in value. Root crops are good average crops. Farm stock is generally in good condition. Fall seeding is coming along well, what little has been done. Potatoes and corn bring higher prices than usual, other crops about as usual. Hay has been our most profitable crop, and apples our least profitable one. The season is about an average one for profit. Streams and wells are now quite low, but the drought is doing little damage to vegetation.

*Dighton* (HOWARD C. BRIGGS). — The corn crop is 25 per cent above the normal in value. Root crops are up to the usual average. Farm stock is in average condition. Fall seeding is poor except on very low ground. Prices for crops raised for market are lower than usual. Strawberries are our most profitable crop, and tomatoes our least

profitable one. The severe drought has made the season unprofitable. Vegetation is dead, and wells and streams dry.

*Swansea* (F. G. ARNOLD). — The corn crop is much above the average as grain and forage. Turnips are small on account of dry weather. Farm stock is in good condition. Early sown fields show good fall seeding, but it is backward on late sown fields. Potatoes bring about the same prices as last year, while all other crops are lower. Late potatoes, early cabbages and early tomatoes were our most profitable crops, and early potatoes and late cabbages our least profitable ones. The season has not been a profitable one. Pastures are very dry, and springs, streams and wells are low.

*Westport* (ALBERT S. SHERMAN). — The corn crop is our most profitable one. Root crops are up to the usual average. Farm stock is in fine condition. Fall seeding is in fine condition. Prices for crops raised for market are about average. Hay has been our most profitable crop, and potatoes our least profitable one. The season has been fairly profitable to our farmers. The drought is not severe, though a few springs and wells are dry and all are low.

*Acushnet* (M. S. DOUGLAS). — The corn crop is up to the normal in value. Root crops are average crops. Farm stock is in good condition, though some have been obliged to feed at the barn. Fall seeding is backward, on account of dry weather. Prices for crops raised for market are below the average, owing, no doubt, to the depression in business. Hay has been our most profitable crop, and potatoes our least profitable one. As a general thing, the season has not been a profitable one. High land is completely dried up, and some wells and springs are dry.

#### PLYMOUTH COUNTY.

*Norwell* (HENRY A. TURNER). — The corn crop is about normal in value. Root crops are up to the usual average. Farm stock is in fairly good condition. Fall seeding is in fairly good condition. Prices for crops raised for market are about the same as usual. Strawberries and cauliflowers have been our most profitable crops, and potatoes and apples our least profitable ones. Considered as a whole, the season has been fairly profitable. Streams, springs and wells are very low, and farmers are carting water.

*Hanover* (HARRISON L. HOUSE). — The corn crop is of normal value. Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for crops raised for market have been the same as usual. Corn and cabbages have been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been fairly profitable. Vegetation has not suffered much from drought; streams, springs and wells are very low.

*Bridgewater* (R. CASS). — The corn crop is one-fourth greater in value than the normal. Root crops are fair average crops. Farm stock is



in good condition. What little fall seeding has been done is above the average. Prices for market crops have ruled lower than usual. Corn is our most profitable crop, and potatoes our least profitable one. The season is not a profitable one for our farmers. Streams, springs and wells that were never known to fail before are dry, making necessary the carting of water for household uses and for cattle.

*Halifax* (MRS. G. W. HAYWARD). — Corn is a good crop, well ripened, and brings a high price. Root crops are not up to the usual average. Farm stock is in quite good condition. Fall seeding is in poor condition, because of drought. Potatoes bring high prices. Potatoes and hay have been our most profitable crops. The season has not been as profitable as some, but is fairly profitable. Everything is dry.

*Plympton* (WINTHROP FILLEBROWN). — The corn crop is not quite up to the normal. Root crops on low ground have done very well. Farm stock is in good condition. Fall seeding is in excellent condition. Prices of market crops have advanced very slightly above former years. Hay has been our most profitable crop, and potatoes our least profitable one. If it were not for the high price of grain, this would be a very profitable year. Vegetation has withstood the drought wonderfully; streams and springs are very low.

*Carver* (J. A. VAUGHAN). — The corn crop is a valuable one. Root crops are not up to the average. Farm stock is in good condition. Fall seeding is in fair condition. Cranberries are our most profitable crop, and this crop, together with cutting, sawing and marketing pine lumber, makes employment for nearly all our inhabitants. Considered as a whole, the season has been a profitable one.

*Rochester* (GEO. H. RANDALL). — The corn crop is about an average crop in value. Root crops are nearly average. Farm stock is generally in good condition. Early seeding very good; late seeding poor, on account of drought. Prices of crops raised for market are a full average. Corn has been our most profitable crop, and potatoes our least profitable one. The balance for the season seems to be on the wrong side. Vegetation has suffered from drought, streams are nearly dry, and springs and wells very low.

## BARNSTABLE COUNTY.

*Bourne* (DAVID D. NYE). — The corn crop is a little above the normal in value. Root crops are up to the usual average. Farm stock is in very good condition. Very little fall seeding has been done, but that put in looks well. The prices for crops raised for market are better than usual. Potatoes and corn have been our most profitable crops, and hay our least profitable one. The season has been fairly profitable. There has been a shortage of vegetation, caused by the drought.

*Mashpee* (W. F. HAMMOND). — The corn crop is an average one. Root crops are about average. Farm stock is in good condition to begin the winter. Fall seeding looks well. Prices for market crops have been



above the average. The cranberry crop has been our most profitable one, and potatoes our least profitable crop. Our farmers have just about held their own. The drought has been a great detriment to the crops; ponds, streams and springs are the lowest they have been for fifty years.

*Barnstable* (JOHN BURSLEY). — The corn crop is 20 per cent above the normal in value. Root crops are good average crops. Farm stock is in good condition. Early fall seeding is looking well, but late sown looks poorly. Crops are fully up to the average in price. Cranberries have been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been profitable. All mowings have suffered greatly from the drought; springs and wells are low. We expect to harvest a fair crop of Cape turnips.

*Dennis* (JOSHUA CROWELL). — The corn crop is above the normal in value. Root crops are below the average. Farm stock is in fair condition. Very little fall seeding has been done; condition below the average. Prices for crops raised for market are about as last year. Potatoes have been our least profitable crop. The season has not been a profitable one. Wells, ponds and springs are very low, and all crops, with the exception of corn, have suffered from drought. The cranberry crop is not more than one-third of a normal crop. Prices have been fair, but not quite so good as last year.

*Harwich* (AMBROSE N. DOANE). — The corn crop is much better than usual. Root crops are average crops. Farm stock is in fair condition. Prices for crops raised for market are higher than usual. Cranberries have been our most profitable crop, and grass our least profitable one. The season has not been profitable. The drought has done a great deal of damage; springs and ponds never were as low as at present.

*Truro* (JOHN B. DYER). — Not enough corn is raised to be mentioned. Turnips and beets are average crops. Farm stock is fully up to the average in condition. Fall seeding is in poor condition, on account of having no rain. Prices for market crops are about the same as usual. Garden truck has been most profitable for us, and potatoes our least profitable crop. The season is hardly up to the average for profit. Fall pasturage and vegetation in general have suffered from drought. The price of cranberries has ruled higher than last year, but the crop has been light.

#### DUKES COUNTY.

*West Tisbury* (GEO. HUNT LUCE). — The corn crop is below the normal in value. Root crops are below the average. Farm stock is in good condition. Prices for crops raised for market are much higher than formerly. Corn has been our most profitable crop, and potatoes our least profitable one. Considered as a whole, the season has been unprofitable. Springs are very low and vegetation below average, owing to drought.

## BULLETIN OF MASSACHUSETTS BOARD OF AGRICULTURE.

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### STRAWBERRY CULTURE.

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By Prof. F. A. WAUGH, *Professor of Horticulture, Massachusetts Agricultural College.*

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Henry Ward Beecher is generally credited with the saying that doubtless God might have made a better fruit than the strawberry, but doubtless God never did. This curious remark would never have kept in circulation so long had it not met with popular approval. In reality this seems to express the settled judgment of a large section of the American people. The strawberry is indeed one of our most popular fruits. It is abundantly used by every one, from the honest laborer to the malefactor of great wealth.

Probably statistics would show that the consumption of strawberries per capita is larger in Massachusetts than in any other State in the Union. This State has an unusually large population of well-paid laborers, artisans, clerks and other good, homely, honest people, generally comprised under the term "the great middle class." These are precisely the people who are the best customers for all classes of fruits. They constitute the great strawberry market.

With such a market at our very doors, it is strange that strawberry growing has not developed into a larger industry in Massachusetts. As a matter of fact, many carloads of berries are shipped here every year. These shipments are not confined to the early spring months, before the local crop is ready, but they continue throughout the season, when Massachusetts berries are being harvested. All through our own berry season car-load shipments are coming forward from the Hudson River section and from Oswego, N. Y. This indicates clearly that our own growers have not yet occupied the home market.

The reason for this is not altogether clear. If there were a large margin of profit in the growing of strawberries doubtless it would not take long to develop sufficiently extensive plantations within the State to supply the home demand. It is certainly true that a good many growers have not found the strawberry business profitable. Nevertheless, on the face of the returns, it would seem that farmers,

fruit growers and market gardeners favorably located with respect to soil and shipping facilities would find a paying opportunity in the growing of strawberries.

There is another side of the question also to be considered, namely, the growing of berries for home use. More than almost any other fruit, the strawberry suffers by being shipped and roughly handled in markets. The fresh berries out of one's own garden, thoroughly-ripened on the vines, picked in the cool of the morning, and eaten at noon with plenty of Jersey cream, — these are what make life worth living and a national inquiry into the status of the farmers' appetite unnecessary. It certainly is a fact that more attention should be given in Massachusetts to the growing of strawberries for home use.

#### SOILS AND LOCALITIES.

Strawberries can be successfully grown in every town in Massachusetts, so far as climate and locality are concerned, — that is, wherever a reasonably good soil is available. The strawberry plant is not extremely fastidious in the matter of soil. Any land which will produce good garden crops, especially good potatoes, will answer for strawberries. A rich, friable, warm loam is best; but even heavy clay or sandy soil will grow strawberries if sufficient care is taken.

The soil should be in a reasonably good state of cultivation before the plants are set out. It is considered bad practice to plant on newly broken sod land. If strawberries can follow corn, celery, tomatoes or other well-cultivated garden crops good results may be expected. If the plants are to be put out in spring, as is the usual practice, the land should be deeply plowed in fall and left to weather through the winter.

#### HOW TO GET THE PLANTS.

Doubtless the simplest way to get strawberry plants is to buy them of a good nurseryman. This is a perfectly safe proposition and nothing need be said against it. At the same time, many persons prefer to grow their own plants, and where this practice can be followed it is certainly to be recommended. In our experience, we have found a certain danger in buying plants, even from the very best of nurserymen. In the first place, it is not always possible to get the varieties wanted nor to get the plants when wanted; and, what is more serious, plants frequently suffer more or less damage in shipment. Even when packed in the very best manner they dry out more or less; or, if they do not dry out, they may mold or heat. These difficulties may be entirely avoided by growing one's own plants.

The importance of beginning with strong, vigorous, one-year-old plants cannot be too much emphasized. The weak, diseased plants, some minus roots, some minus crowns, and some two years old, sent out by bogus nurserymen, are not worth planting. A two-year-old plant which has once borne fruit is not fit to transplant; yet



a considerable percentage of cheap plants offered every year on the market and taken from old fruiting beds are these two-year-old, worthless stock.

The simplest and surest way of getting plants is to take them from the sides of the fruiting rows. Each plant sends out runners during the year which form new plants at each joint. If these new plants become established in deep, rich soil, they will make strong roots and crowns. The strawberry grower, thus carefully selecting along his own strawberry rows, can secure such plants as he desires. These plants may be taken out in spring just at the time of transplanting.

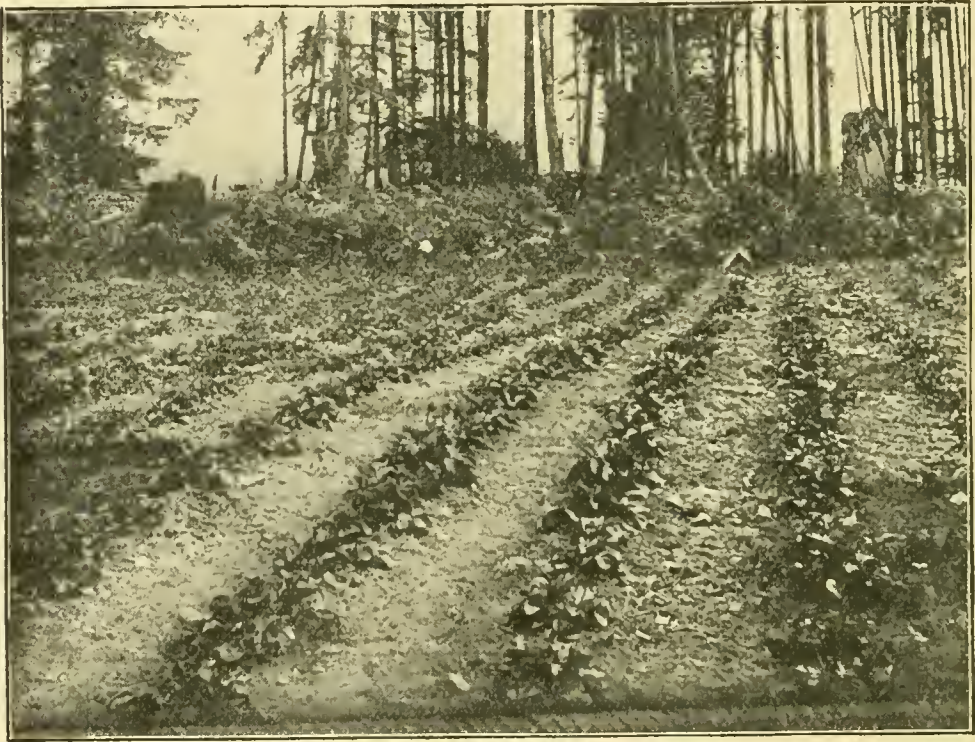


FIG. 1.— A New Strawberry Field in a Clearing in the Woods.

We have found it rather better, however, to take them up during the fall and heel them in. Small beds are especially prepared for this purpose in deep, well-drained soil. These are covered with loose, dry mulch during the winter, and the plants are taken out in prime condition at transplanting time in the spring.

A word should be said also about the use of potted plants. These are largely advertised every fall and are very interesting to amateurs. Any one who has a few small flowerpots ( $2\frac{1}{4}$  or  $2\frac{1}{2}$  inches) at his disposal may grow these plants for himself. The pots are buried in the soil beside the fruiting rows in the latter part of June or the first of July. Each pot is filled with soil, and a young strawberry plant, still attached to the mother plant, is set into the buried pot. Plants so treated should form large, strong crowns by the last of August. They may then be severed from the mother plants and transplanted



from the pots with very little shock. Such plants will bear a small crop the next year, — under favorable conditions, a moderately good crop. This method is advertised every autumn as a means of saving one year on the strawberry plantation. In reality, it is not a commercial method at all and not to be recommended for use on a large scale. Still, it is very interesting to the amateur and always worth his (or her) while.

#### SETTING OUT PLANTS.

Spring setting of strawberry plants is the regular practice. On light, well-drained soils which do not heave fall setting may be practiced, it being always necessary to mulch the beds well in autumn.

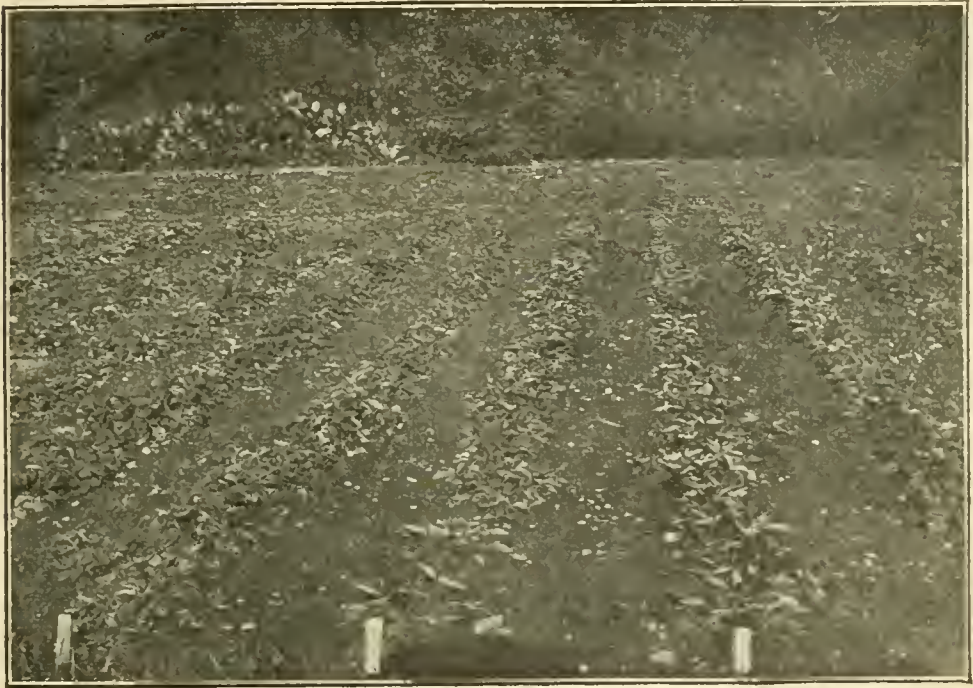


FIG. 2.—Strawberry Field grown by Hedgerow System.

However, fall setting, aside from the use of potted plants, as described above, is not to be generally recommended. On the other hand, it is good practice to set the plants just as early as possible in the spring. In some localities and with some growers there is a prejudice in favor of late spring setting, but this does not apply to most parts of Massachusetts.

Where large areas are to be set with strawberry plants, a business-like organization of the work is essential. The ground should be thoroughly prepared, well harrowed and in prime condition. The rows should be carefully marked out where they are to go. Usually these will be 3 feet apart. Some growers prefer  $3\frac{1}{2}$  feet, but a larger number prefer less, — some 2 feet, some  $2\frac{1}{2}$  feet. The plants will be set at varying distances in these rows, depending upon the system of culture to be followed; about 16 inches apart is the distance usually prescribed. The plants should be set with a dibble. The man who

does the setting takes this in his right hand while he takes up the plant with his left. The dibble is thrust into the loose soil at the point where the plant is to stand, is pushed forward, and the plant is inserted with the left hand into the opening thus made. The dibble is then raised out of the ground and the soil firmed heavily about the roots with both hands. This firming is important. The man then moves forward on his knees to the position for the next plant.

It is highly important to observe in setting plants that they be not placed too deeply in the soil, nor yet too shallow. If they are placed so deeply that the crown is covered with soil, the plant will not grow. If they are placed so high that the crown is well above the soil, they



FIG. 3. — Mulching Strawberry Bed.

will dry out and die. The correct position is to have the bud or crown exactly at the surface. Planters require constant watching on this point.

#### GENERAL CULTURE.

After planting, the strawberry beds require the best sort of tillage. This is a crop which can never be profitably neglected. The cultivator should be kept going between the rows, especially in dry weather. Such cultivations should follow one another every week or ten days, some soils, of course, requiring more tillage than others. On large plantations a double two-horse cultivator can be used to advantage; on ordinary plantations the single one-horse cultivator will usually be employed. The light frame with harrow teeth will be most useful in soil which is in proper condition.

Tillage should become less frequent towards fall and may cease



altogether after September 10. Before heavy freezing occurs the beds should be mulched. At least, mulching is generally considered to be necessary and on the whole seems to be worth while, though we have seen excellent crops of berries grown on unmulched beds. Here again a great deal would depend on the character of the soil, drainage, exposure, etc.

It should be distinctly understood that rapid rotations are essential to the successful culture of the strawberry. The crude, old-fashioned plan of setting strawberry beds and leaving them to themselves for eight or ten years at a stretch is merely a waste of land. It is still unfortunately customary in many parts of New England to leave



FIG. 4.—Strawberry Field at Picking Time

strawberry beds for three or four years, with the idea of taking two or three crops from one planting. The most successful growers, however, undertake to secure only one crop from any one plantation. The plants are grown one year, are fruited the next, and the beds are plowed up immediately after the berry harvest. This method not only gives the best fruit, but proves to be the most profitable.

#### MULCHING.

It is customary to protect strawberry plants through the winter by covering them with mulch. This mulch is raked off the rows in spring, as soon as the snow is off, allowing the plants to grow freely. Some very conscientious growers rake the mulch entirely out of the field. This is done so as to permit the running of cultivators between the rows. Such spring tillage is unquestionably a good thing, though

it is troublesome and expensive. Some men even go so far as to put back the mulch after cultivating the ground. Usually the mulch is left between the rows, as close to the plants as possible. It thus serves to protect the fruit from becoming soiled during rain storms. Without such protection the dirt spatters up onto the berries, and leaves them in very bad condition for market.

Various kinds of material are used for this mulching process. Anything which is clean, not too full of weed seeds, and will lie closely on the ground will answer the purpose. Marsh hay, poor straw and other bedding material may be used. Cornstalks make an excellent mulch, except that they are rather coarse. Shavings and sawdust are sometimes used, but are objectionable; they are apt to injure the soil. Buckwheat straw, pea straw and waste of that character are especially satisfactory.

This mulch should be put on late in the fall, after moderate freezing of the ground.

In good, well-drained soil in most towns in Massachusetts strawberries will often go through the winter in very good condition without mulching. Nevertheless, mulching is safer, and the mulch is needed during fruiting time, even though it may not be required for winter protection.

#### METHODS OF MANAGEMENT.

There are four general methods of managing strawberry beds for common use. These may be called (a) solid beds, (b) matted rows, (c) hedge-row system, (d) hill system.

The old-fashioned, lazy and shiftless method of growing strawberries is to keep them in solid beds. Plants are set out in rows at any ordinary distance, and runners are allowed to form *ad libitum*. Within a year or two the ground is entirely covered with strawberry plants. These take care of themselves as well as they can, and the grower accepts what fruit he gets as a gratuity. Such a bed on good soil will last for five or six years and give some fruit. The best method of treating such beds is to burn them over early every spring. This burning kills some fungous diseases and a good many insects. This method, of course, is not recommended.

The matted-row system is the one most commonly practiced. According to this method the plants are set in double rows. There will be two rows of plants about 8 inches or a foot apart, then a space of 3 feet for cultivation, then two more rows, then a space, etc. The plants will be set 14 to 18 inches apart in the rows, usually alternating in the adjoining rows. As these form runners, they are allowed to set new plants along the middle of the double row and for a small space on each side. The bed soon comes to consist of matted rows about 18 inches wide, with space for running a cultivator between. If good fertilization is given, and good culture on good soil, such a bed will give very fair results. For ordinary market purposes it answers well.



The hedge-row system is an improvement on the matted-row system now considerably practiced by advanced growers. Any one who wishes to grow a specially fine grade of berries for home use, or for a fancy market, can well afford to adopt this improved plan. According to this system rows are placed about  $2\frac{1}{2}$  feet apart, with plants 14 inches apart in the row. A very limited number of new plants are allowed to set from the runners, these being kept quite closely in the line of the original row. Each plant, therefore, receives the benefit of much more thorough cultivation than it does in the matted-row system. It also has the benefit of a larger proportion of fertilizer, it has more space to develop, and it is otherwise more favorably situated. Larger fruit of somewhat better grade can be grown than by the matted-row method.

The hill system is used only by enthusiastic amateurs, or those who wish to grow fruit for exhibition purposes. In this case the plants are set in suitable rows, the individual plants being 18 inches or even 2 feet apart, and each plant is kept down to a single hill by cutting off all runners as fast as they form. Thus each plant can be given the very best of care, and has the benefit of all the surrounding soil and light.

#### FERTILIZERS.

Liberal feeding is desirable for strawberry beds. This liberality must begin as soon as the plants are set out, or even before, for the soil should be in first-class condition before planting. Professor Voorhees suggests 500 to 800 pounds of fertilizer, made up as follows: raw ground bone, 1 part; acid phosphate, 1 part; muriate of potash, 1 part, — to be applied before setting out the plants. Plants should then have an application of some quick-acting nitrogenous fertilizer, preferably nitrate of soda, as soon as they start to grow. This would mean 50 to 60 pounds of nitrate of soda, or 50 to 60 pounds sulphate of ammonia, or 100 pounds of dried blood. The necessary point is to give the plants a vigorous growth from the very first. The second spring, when a crop of fruit is expected, an additional dressing of nitrogenous fertilizer should be given. This would consist of 100 pounds of nitrate of soda or 150 pounds of dried blood per acre.

Prof. William P. Brooks, fertilizer expert of the Massachusetts Experiment Station, makes the following recommendations regarding the fertilization of strawberry plantations : —

	Pounds
Tankage or Peruvian guano, . . . . .	600
Fine ground bone, . . . . .	1,000
Low-grade sulphate of potash, . . . . .	600
Nitrate of soda, . . . . .	100

All of these materials may be mixed, applied after plowing and before setting the plants, and thoroughly incorporated into the soil by harrowing.

	Pounds.
Dried blood, . . . . .	200
Tankage or Peruvian guano, . . . . .	800
Low-grade sulphate of potash, . . . . .	600
Basic slag meal, . . . . .	1,000
Nitrate of soda, . . . . .	100

The slag in this selection of materials must not be mixed with the blood, tankage or guano, as it will cause a loss of ammonia. It will be better, therefore, to apply the slag by itself, but all the other materials may be mixed before application.

#### DISEASES AND INSECTS.

Strawberry plants are not subject to any very serious diseases. The leaf spot may be a partial exception to this statement, but on well-managed fields it is not usually serious. Thorough spraying with Bordeaux mixture is usually recommended for this disease, but good cultivation and liberal feeding will do a great deal more by way of prevention than can be done by any spray solutions.

Winterkilling of the plants, especially the roots, is sometimes reported from different parts of the State, but this can usually be prevented by proper mulching, as explained above.

The insects most commonly noticed in strawberry fields are the white grub, the crown borer and the leaf roller. The white grub is found the most commonly in raw land not in a good state of cultivation, or such as has been heavily treated with quantities of unrotted barnyard manure. Good soil and thorough cultivation are the best preventives.

The leaf roller is sometimes quite troublesome, and after it becomes thoroughly established in a plantation there is no practical remedy for it. If thoroughly sprayed with Paris green or other arsenical poisoning as soon as it appears, its work may be checked.

The crown borer may be largely circumvented by proper rotations. If new beds are placed beside old infested beds the crown borer is pretty sure to do serious damage. The obvious preventive, therefore, is to plant strawberries on fresh soil, away from old infested beds.

#### VARIETIES.

There are hundreds of varieties of strawberries on the market. Every nurseryman has his favorites, and every year sees a number of novelties exploited. An unusually large proportion of these varieties are meritorious. In fact, almost any variety will give good results if well cultivated. It would be impossible within the limits of this paper to give a long list of varieties with descriptions or notes; it may suffice to say that Glen Mary, Clyde, Dunlap, Bubach, Warfield and Marshall are the kinds most commonly and successfully grown in Massachusetts.

## MARKETING THE CROP.

Most localities in Massachusetts have an additional advantage in strawberry growing in the fact that pickers can be easily secured for a moderate price. In all factory towns it is possible to get a number of energetic boys and girls for this work. The almost universal payment for picking is 2 cents a quart.

Berries are always picked early in the morning and placed in quart baskets. These baskets are sent to market in crates holding 24, 32, 36 or 48 quarts.

It is good practice, especially where a good grade of fruit is grown, to sort all the berries, facing up each quart box as apples are faced in barrels. This does not mean that small berries are to be put in the bottom of the box, but simply that the fruit is to be made to look as attractive as possible.

Usually berries shipped in crates to city markets, like Springfield, Worcester and Boston, bring reasonably good prices. When they do not, it is owing to some local difficulty, or to a temporary glut. The most satisfactory way to sell berries, of course, is in the home market, direct to one's own customers. There are so many localities in which this can be done that this sort of trade may be considered characteristic of Massachusetts. It is a line of business which will bear very much larger development.











